

Daily report

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## Analysis and prediction of COVID-19 for EU-EFTA-UK and other countries

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Situation report 129

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*With the financial support of*

## Foreword

The present report aims to provide a comprehensive picture of the **pandemic situation of COVID-19** in the EU countries, and to be able to foresee the situation in the next coming days. We provide some figures and tables with several **indexes and indicators** as well as an **Analysis** section that discusses a specific topic related with the pandemic.

As for the predictions, we employ an **empirical model**, verified with the evolution of the number of confirmed cases in previous countries where the epidemic is close to conclude, including all provinces of China. The model does not pretend to interpret the causes of the evolution of the cases but to permit the **evaluation of the quality of control measures made in each state** and a **short-term prediction of trends**. Note, however, that the effects of the measures' control that start on a given day are not observed until approximately 7-14 days later.

We show an individual report with 8 graphs and a summary table with the main indicators for different countries and regions. We are adjusting the model to **countries and regions** with at least 4 days with more than 100 confirmed cases and a current load over 200 cases.

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## Situation and highlights

### Global situation

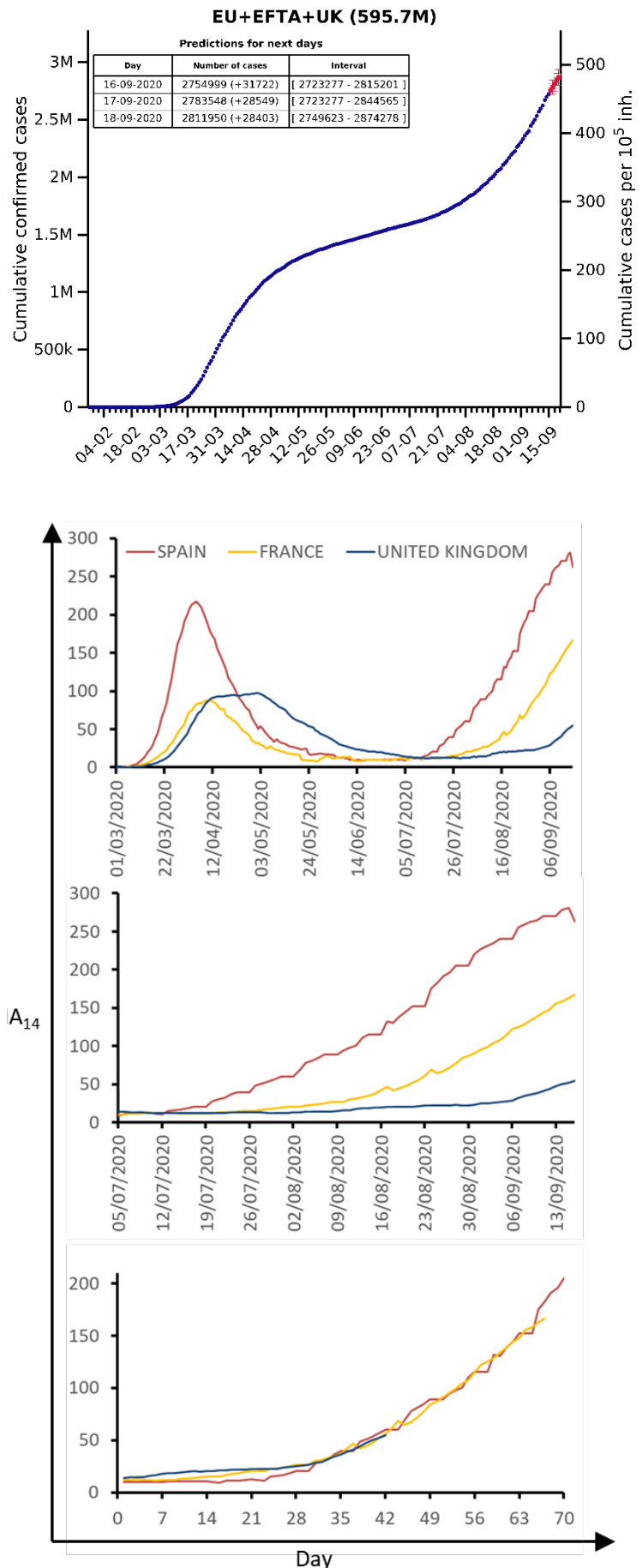
The set of three figures shows the evolution of 14-day cumulative incidence ( $A_{14}$ ) of the three European countries that currently report the highest number of cases per week. From a graphical point of view, we can speak about a second wave, although current epidemiological situation is very different from that of March and April, since the diagnosis covers a much higher percentage of cases. The second figure is an enlargement of the second wave, starting at the Spanish second wave's onset. In this figure we observe that the growths in France and UK started later. In the third figure we have shifted the curves so that their onsets are overlapped. Then, we observe that France and Spain are really following a very similar evolution and that UK is also starting the same way.

The three countries have some characteristics in common like a large population or highly densed metropolitan areas. Nevertheless, no country can relax surveillance, since the second waves can affect anyone. Epidemiological surveillance must be increased as much as possible.

Growth in France (13/7/2020) started about 23 days after Spain (19/6/2020), and growth in the UK (6/8/2020) started about 24 days after France. These days correspond to day 0 of the third graph.

### Highlights

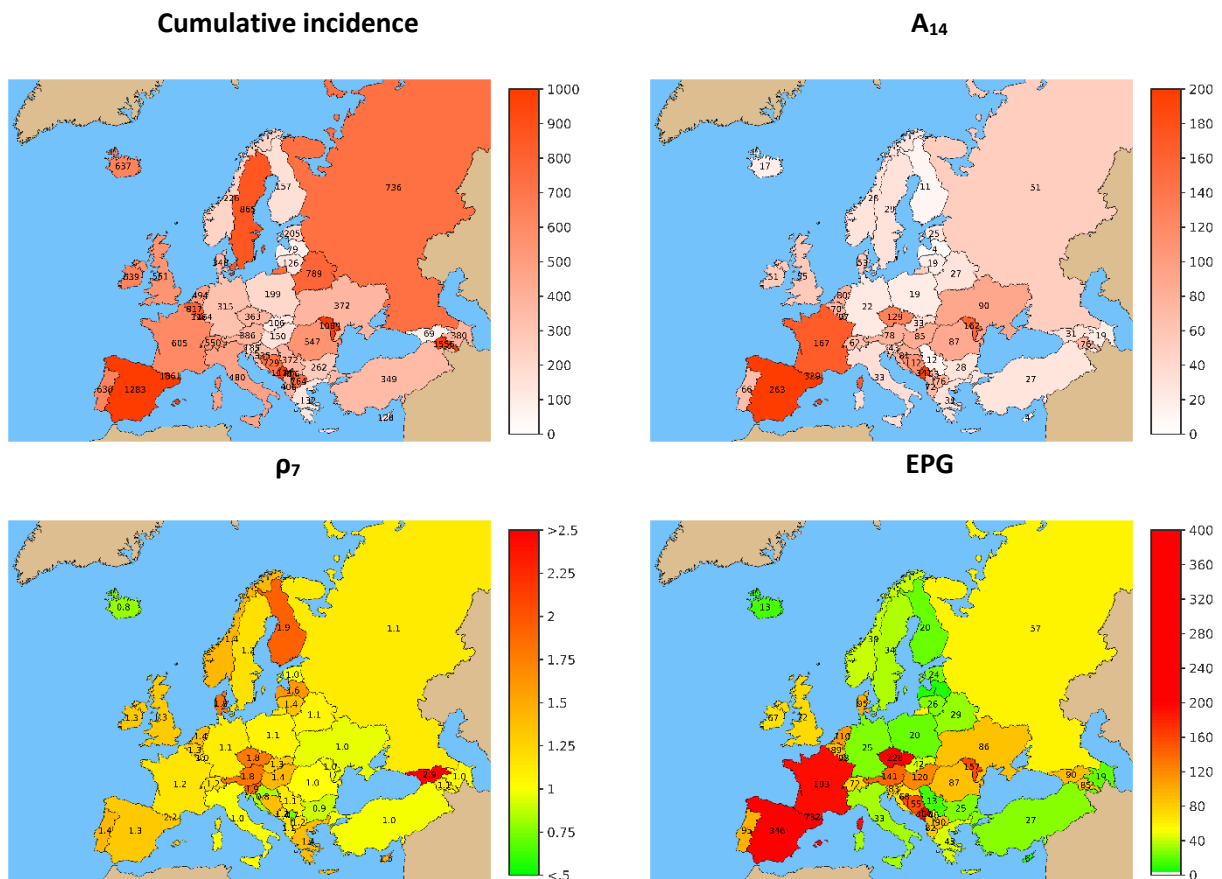
- Spain, France, Czech Republic and Malta are above the 100 cases per 100,000 inh. last 14 days.
- All the countries but Bulgaria, Croatia and Iceland have an empiric reproduction number equal to or higher than 1.
- Six countries show an  $EPG > 100$  (Spain 358, Czech Republic 228, France 193, Austria 141, Hungary 120, Netherlands).



## Situation and trends per country

Maps of current situation in EU countries. Colour scale is indicated in each legend.

- Cumulative incidence: total number of reported cases per 100,000 inhabitants
- $A_{14}$ : Cumulative incidence last 14 days per 100,000 inhabitants (active cases)
- $\rho_7$ : Empiric reproduction number
- EPG: Effective Potential Growth ( $EPG = A_{14} \cdot \rho_7$ )



**Table of current situation in EU countries.** Colour scale is indicated in each legend.

Country	Reported data						Indexes		
	Cumulative cases	Attack rate /10 <sup>5</sup> inh.	Cumulative deaths	Mortality /10 <sup>5</sup> inh.	Active cases (last 14 days)	14-day attack rate /10 <sup>5</sup> inh.	$\rho_7^{(1)}$	EPG <sup>(2)</sup>	Biocom-Cov degree
Spain	603,167	1,282.6	30,004	63.8	132,194	281.1	1.27	358	9
France	395,104	605.3	30,999	47.5	109,097	167.1	1.16	193	8
United Kingdom	374,228	551.3	41,664	61.4	37,060	54.6	1.31	72	6
Italy	289,990	479.6	35,633	58.9	19,801	32.7	0.99	33	4
Germany	263,663	314.7	9,368	11.2	18,808	22.4	1.11	25	4
Romania	105,298	547.4	4,236	22.0	16,705	86.8	1.00	87	7
Belgium	94,701	817.1	9,930	85.7	8,107	70.0	1.27	89	6
Sweden	87,345	864.9	5,851	57.9	2,950	29.2	1.18	34	4
Netherlands	84,697	494.3	6,249	36.5	13,640	79.6	1.38	110	7
Poland	75,134	198.5	2,227	5.9	7,212	19.1	1.06	20	3
Portugal	65,021	637.7	1,875	18.4	6,778	66.5	1.42	95	6
Switzerland	47,640	550.5	1,747	20.2	5,355	61.9	1.17	72	6
Czech Republic	38,896	363.2	476	4.4	13,779	128.7	1.77	228	8
Austria	34,744	385.8	757	8.4	7,003	77.8	1.81	141	7
Ireland	31,549	638.9	1,787	36.2	2,524	51.1	1.32	67	6
Denmark	20,129	347.5	633	10.9	3,045	52.6	1.81	95	6
Bulgaria	18,216	262.2	736	10.6	1,950	28.1	0.90	25	4
Hungary	14,460	149.7	654	6.8	8,203	84.9	1.42	120	7
Croatia	13,749	334.9	230	5.6	3,335	81.2	0.84	68	6
Greece	13,730	131.7	313	3.0	3,206	30.8	1.39	43	5
Norway	12,277	226.5	265	4.9	1,494	27.6	1.42	39	4
Finland	8,725	157.5	339	6.1	583	10.5	1.93	20	3
Luxembourg	7,284	1,163.6	124	19.8	607	97.0	1.01	98	7
Slovakia	5,768	105.6	38	0.7	1,779	32.6	1.30	42	5
Slovenia	3,837	184.6	131	6.3	904	43.5	1.90	83	6
Lithuania	3,442	126.4	87	3.2	513	18.8	1.35	26	4
Estonia	2,722	205.2	64	4.8	327	24.7	0.98	24	4
Malta	2,454	555.8	16	3.6	522	118.2	NA	NA	7
Iceland	2,174	637.1	10	2.9	58	17.0	0.79	13	3
Cyprus	1,540	127.6	22	1.8	50	4.1	1.47	6	2
Latvia	1,482	78.6	35	1.9	78	4.1	1.60	7	2
Liechtenstein	111	291.1	1	2.6	3	7.9	NA	NA	1

Colour scale							
Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>100
Best	Best	Best	Best	Best	Best	0.0	0

<sup>(1)</sup>  $\rho_7$  is the average of 7 consecutive  $\rho$ , but can still fluctuate. <sup>(2)</sup> EPG stands for Effective Growth Potential, which is the product of reported cumulative incidence of last 14 days per 10<sup>5</sup> inhabitants by  $\rho_7$  (empiric reproduction number). Biocom-Cov degree is an epidemiological situation scale based on the level of last week's mean daily new cases (<https://upcommons.upc.edu/handle/2117/189661>, <https://upcommons.upc.edu/handle/2117/189808>).

## Situation and trends in some European regions<sup>1</sup>

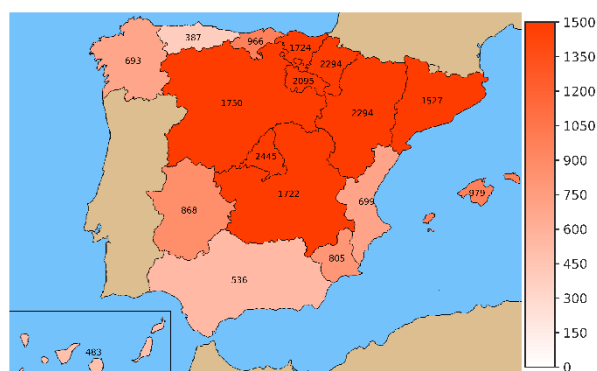
Table of current situation in Spain regions. Colour scale is indicated in each legend.

Country	Reported data						Indexes		
	Cumulative cases	Attack rate /10 <sup>5</sup> inh.	Cumulative deaths	Mortality /10 <sup>5</sup> inh.	Active cases (last 14 days)	14-day attack rate /10 <sup>5</sup> inh.	$\rho_7^{(1)}$	EPG <sup>(2)</sup>	Biocom-Cov degree
Madrid	162,940	2,453.7	8,777	132.2	40,077	603.5	1.30	783	9
Catalunya	117,214	1,549.4	5,779	76.4	12,870	170.1	0.93	159	7
Andalucía	45,114	535.4	1,566	18.6	11,079	131.5	0.89	117	7
Castilla y Leon	41,998	1,744.0	2,890	120.0	6,628	275.2	1.12	308	9
Euskadi	38,071	1,747.9	1,710	78.5	7,916	363.4	1.01	369	8
Castilla-La Mancha	35,007	1,719.8	2,927	143.8	6,553	321.9	1.08	348	9
Comunitat Valenciana	34,982	703.2	1,516	30.5	6,163	123.9	0.83	103	6
Aragon	30,255	2,290.7	1,200	90.9	3,773	285.7	1.19	341	9
Galicia	18,703	692.6	674	25.0	3,427	126.9	0.97	123	7
Navarra	15,004	2,308.4	541	83.2	2,801	430.9	1.31	563	9
Murcia	12,032	808.8	154	10.4	4,182	281.1	0.85	239	8
Baleares	11,249	947.0	260	21.9	2,170	182.7	0.65	119	6
Canarias	10,393	470.9	191	8.7	3,423	155.1	0.81	126	7
Extremadura	9,270	870.1	537	50.4	1,855	174.1	1.16	202	8
La Rioja	6,642	2,118.1	382	121.8	1,110	354.0	0.93	328	9
Cantabria	5,611	964.6	218	37.5	1,559	268.0	1.07	288	8
Asturias	3,954	386.8	338	33.1	674	65.9	1.11	73	6
Melilla	600	708.3	3	3.5	242	285.7	NA	NA	9
Ceuta	449	529.2	7	8.3	108	127.3	NA	NA	7

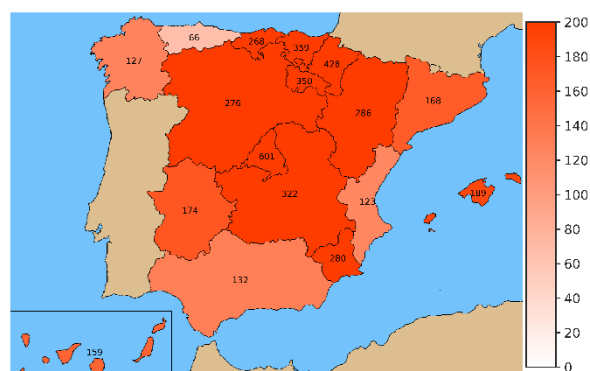
Colour scale							
Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>100
Best	Best	Best	Best	Best	Best	0.0	0

Cumulative incidence



$\rho_7$

A<sub>14</sub>



EPG

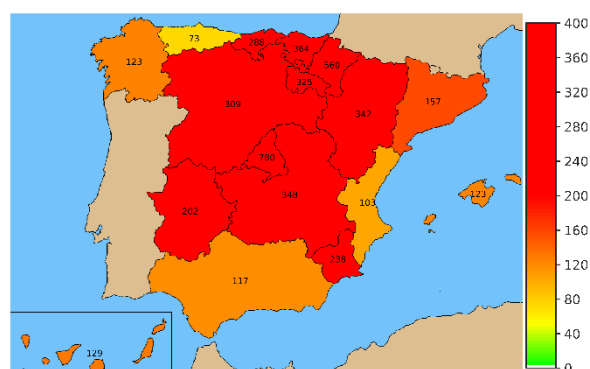
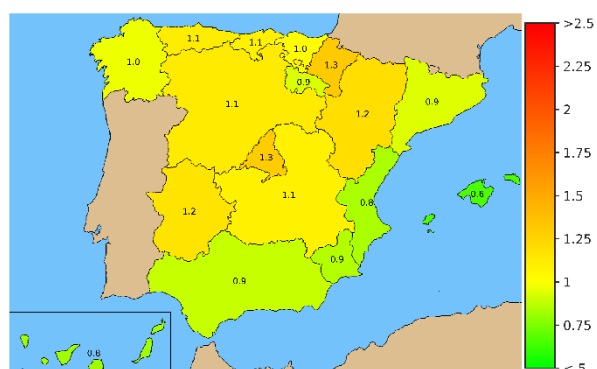


Table of current situation in United Kingdom regions. Colour scale is indicated in each legend.

<sup>1</sup> <https://github.com/ec-jrc/COVID-19/tree/master/data-by-region>

Country	Reported data				Indexes		
	Cumulative cases	Attack rate /10 <sup>5</sup> inh.	Active cases (last 14 days)	14-day attack rate /10 <sup>5</sup> inh.	$\rho_7^{(1)}$	EPG <sup>(2)</sup>	Biocom-Cov degree
Midlands	63,901	630.5	6,960	68.7	1.42	98	7
North West	62,086	845.7	8,509	115.9	1.60	186	8
North East and Yorkshire	59,431	727.3	6,670	81.6	1.42	116	7
London	43,685	487.5	4,078	45.5	1.30	59	6
South East	40,208	438.0	2,281	24.8	1.31	33	5
East of England	28,449	456.3	1,660	26.6	1.33	35	5
Wales	19,681	627.6	1,618	51.6	1.43	74	6
South West	15,947	283.5	1,214	21.6	1.19	26	4
Northern Ireland	8,502	449.1	1,208	63.8	0.97	62	6
Greater Glasgow and Clyde	6,584	550.5	1,087	90.9	1.05	95	7
Lothian	3,659	426.5	281	32.8	1.49	49	6
Lanarkshire	3,426	1,074.0	439	137.6	1.63	224	8
Tayside	2,213	557.4	70	17.6	0.71	13	3
Grampian	2,026	405.2	87	17.4	0.87	15	3
Ayrshire and Arran	1,483	404.1	124	33.8	1.06	36	5
Forth Valley	1,239	404.9	90	29.4	0.63	19	4
Fife	1,049	280.5	52	13.9	1.14	16	3
Highland	501	212.3	84	35.6	0.69	25	5
Borders	420	365.2	48	41.7	1.98	83	6
Dumfries and Galloway	333	225.0	19	12.8	1.24	16	3
Shetland	57	247.8	1	4.3	3.00	13	3
Orkney	17	77.3	0	0.0	NA	NA	0
Eilean Siar (Western Isles)	9	32.1	2	7.1	NA	NA	0

Colour scale						
Worst	Worst	Worst	Worst	>2.0	>100	
Best	Best	Best	Best	0.0	0	

**Table of current situation in Portugal regions.** Colour scale is indicated in each legend.

Region	Reported data						Indexes		
	Cumulative cases	Attack rate /10 <sup>5</sup> inh.	Cumulative deaths	Mortality /10 <sup>5</sup> inh.	Active cases (last 14 days)	14-day attack rate /10 <sup>5</sup> inh.	$\rho_7^{(1)}$	EPG <sup>(2)</sup>	Biocom-Cov degree
Lisbon	33,297	1,175.3	706	24.9	3,257	115.0	1.46	168	8
Norte	23,528	657.6	859	24.0	2,587	72.3	1.22	88	7
Centro	5,330	237.8	254	11.3	500	22.3	0.14	3	5
Algarve	1,259	286.1	19	4.3	147	33.4	1.35	45	5
Alentejo	1,175	164.1	22	3.1	228	31.8	2.42	77	6
Açores	240	98.4	15	6.1	27	11.1	1.11	12	3
Madeira	192	75.3	0	0.0	32	12.5	1.29	16	3

Colour scale							
Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>100
Best	Best	Best	Best	Best	Best	0.0	0

**Table of current situation in Austria regions.** Colour scale is indicated in each legend.

Region	Reported data						Indexes		
	Cumulative cases	Attack rate /10 <sup>5</sup> inh.	Cumulative deaths	Mortality /10 <sup>5</sup> inh.	Active cases (last 14 days)	14-day attack rate /10 <sup>5</sup> inh.	$p_7^{(1)}$	EPG <sup>(2)</sup>	Biocom-Cov degree
Wien	11,366	599.2	229	12.1	3,361	177.2	1.35	239	9
Oberösterreich	5,357	361.5	65	4.4	674	45.5	1.38	63	6
Tirol	5,197	688.3	102	13.5	836	110.7	1.31	145	8
Niederösterreich	4,944	294.6	115	6.9	921	54.9	1.56	86	7
Steiermark	2,897	233.1	144	11.6	425	34.2	1.35	46	5
Salzburg	1,823	1,199.3	40	26.3	158	103.9	1.44	150	8
Vorarlberg	1,388	352.3	20	5.1	301	76.4	1.83	140	7
Kärnten	714	128.2	13	2.3	69	12.4	1.90	24	3
Burgenland	601	208.7	11	3.8	110	38.2	0.97	37	5

Colour scale							
Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>100
Best	Best	Best	Best	Best	Best	0.0	0

<sup>(1)</sup>  $p_7$  is the average of 7 consecutive  $p$ , but can still fluctuate. <sup>(2)</sup> EPG stands for Effective Growth Potential, which is the product of reported cumulative incidence of last 14 days per 10<sup>5</sup> inhabitants by  $p_7$  (empiric reproduction number). Biocom-Cov degree is an epidemiological situation scale based on the level of last week's mean daily new cases (<https://upcommons.upc.edu/handle/2117/189661>, <https://upcommons.upc.edu/handle/2117/189808>).

## Situation and trends in other countries

Country	Reported data						Indexes		
	Cumulative cases	Attack rate /10 <sup>5</sup> inh.	Cumulative deaths	Mortality /10 <sup>5</sup> inh.	Active cases (last 14 days)	14-day attack rate /10 <sup>5</sup> inh.	$p_7^{(1)}$	EPG <sup>(2)</sup>	Biocom-Cov degree
United States of America	6,606,293	1,995.8	195,937	59.2	530,641	160.3	1.09	176	8
India	5,020,359	371.1	82,066	6.1	1,250,836	92.4	1.06	98	7
Brazil	4,382,263	2,061.7	133,119	62.6	431,332	202.9	1.24	252	8
Russia	1,073,849	735.8	18,785	12.9	73,801	50.6	1.12	57	6
Peru	738,020	2,238.3	30,927	93.8	80,891	245.3	1.10	269	9
Colombia	728,590	1,431.9	23,288	45.8	104,521	205.4	0.92	190	8
Mexico	676,487	524.7	71,678	55.6	70,451	54.6	0.95	52	6
Argentina	565,432	1,251.1	11,710	25.9	147,710	326.8	1.08	352	9
Chile	437,983	2,291.2	12,040	63.0	24,838	129.9	1.02	132	8
Iran	407,353	485.0	23,453	27.9	30,459	36.3	1.09	40	5
Saudi Arabia	326,930	939.1	4,338	12.5	10,260	29.5	0.86	25	4
Pakistan	303,089	137.2	6,393	2.9	6,499	2.9	1.16	3	2
Canada	138,803	367.8	9,188	24.3	9,378	24.8	1.29	32	4
Qatar	122,214	4,242.0	208	7.2	3,220	111.8	1.01	113	7
Ecuador	119,553	677.6	10,963	62.1	5,244	29.7	0.41	12	7
Belarus	74,552	789.0	761	8.1	2,590	27.4	1.05	29	4

Colour scale							
Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>100
Best	Best	Best	Best	Best	Best	0.0	0

<sup>(1)</sup>  $p_7$  is the average of 7 consecutive  $p$ , but can still fluctuate. <sup>(2)</sup> EPG stands for Effective Growth Potential, which is the product of reported cumulative incidence of last 14 days per 10<sup>5</sup> inhabitants by  $p_7$  (empiric reproduction number). Biocom-Cov degree is an epidemiological situation scale based on the level of last week's mean daily new cases (<https://upcommons.upc.edu/handle/2117/189661>, <https://upcommons.upc.edu/handle/2117/189808>).

## Analysis: Spanish second wave (III). Personal responsibility measure comparisons. A policy proposal to advance research.

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In the assessment of last week dealing with the analysis of the second wave of Covid-19 infection in Spain<sup>2</sup> we asked ourselves about the different hypotheses that can explain why Spain is the leading country in new infections. We showed that Spain opened earlier than most countries in terms of active cases and that the evolution has been worse. However, there have been some key countries (France, Netherlands, Belgium, Romania as key examples) that opened roughly at the same time in epidemiological terms and have had a better evolution in the sense that the number of cases started to raise later. As we are arguing, **the explanation for Spain leading the second wave is multifactorial**. In last report we started another factor or hypothesis, which states that **Spanish population has followed a pattern of interactions and behavior who has facilitated transmission compared with the pattern of other countries**. First, we discussed the use of masks in Barcelona<sup>3</sup>, and we will continue the discussion in this report. Next week we will explore the third hypothesis, which points to low-prepared control strategies like test and trace.

We must recall that the relevance of risky behavior in Covid-19 has been established by the apparent low dispersion of this disease, namely, low number of people carry out the majority of infections. Second, the risky behavior is associated to two factors, one related with default-patterns of behavior and other with active individual prevention measures:

- **Default patterns of behavior refer to the properties and structure of the interaction between people infected.** This refers to how often, given a cultural and sociological setting, a given population has an interaction on average that it is highly risky. The most classical example is the distance between family and friends in a meeting, or the number of drops and aerosol expels depending on the voice level. It is a fact that keeping distances prevent infections and strong indications than high voice/singing or low ventilation increase risk<sup>4</sup>. All other things equal, a country with more *karaokes* is riskier than one without. All other things equal, a country where the typical distance in a family meal is 30-50 cm is more dangerous than one where the average is 70-100 cm.
- **Active individual prevention measures.** Health authorities have insisted in Spain and other countries that mask, distance and hand-washing are key features that can prevent infections. Good ventilation and the avoidance of party-like gatherings have also been indicated as things to avoid. A country where its population follows this instruction more widely is going to have less propagation than one where its citizen follow the guidelines less broadly. The messages often mix the idea that you protect the other with messages that you can protect yourself. The general idea of the message is that using these measures you mainly protect others but also a bit yourself.

We showed that mask wearing in the streets and supermarkets during daytime hours was pretty high but dropped to almost non-existent in bar terraces of Barcelona<sup>3</sup>. We also showed that mask wearing in Barcelona was rather low in the groups' gatherings of the main large parks with one important caveat. Elder population was very absent in those settings. We do not have the resources to check where the elder population meets (banks in the street, small squares, small parks?) and at what ratios they do wear mask. We also do not have the resources to check how the picture changes in squares and small parks. This would be very important from now on, especially for those near schools where parents and kids gather at very particular hours.

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<sup>2</sup> <https://upcommons.upc.edu/handle/2117/328331>

<sup>3</sup> <https://upcommons.upc.edu/handle/2117/328775>

<sup>4</sup> <https://doi.org/10.1080/02786826.2020.1812502>



We point out that the latest COSMO-STUDIO by Instituto de Salud Carlos III in Spain<sup>5</sup> points in exactly the same direction. Spaniards perceive more risk in agglomerations outside home, especially in public transport, but they consider family gatherings at home one of the lower risk activities.

**Combined, the picture that emerges is clear. There is important data pointing to relaxation when Spaniards meet together outside in terraces and that could reflect what is happening in family/friendly meetings in personal houses, where risk is considered one of the lower risk activities**

It is precisely in those close settings where the probabilities of getting infected increase dramatically. This is not different in Spain. While Spain does not provide anonymized information of the tracing work which could give detailed crosstabs of where and when people get infected (or at least those detected), health officials did report the following information<sup>6</sup>:

- 32 % of cases (33 % of clusters) come from social meetings with friends or family who are not the close family unit and leisure activities.
- 37 % of cases (31 % of clusters) come from interactions with people at work or in the link between family and work. For this particular setting we do not have information of how many were associated with close contact with different people at work/lunch and subsequent contagion in the family and how many due to friendly gatherings of works colleagues and respective families.

In any case, around 30% of clusters are associated uniquely with close distance between sporadic or unknown contacts.

Furthermore, epidemiologists and health official teams search patterns of high risk in selecting those close contacts of PCR positives that must follow quarantine. Presently, quarantines are imposed to 4 people per positive case on average in Spain/Catalunya, indicating that only very close contacts are selected. Public health protocols define as close contacts those that have spent more than 15 minutes at less than 1.5-2 meters from the positive case, usually without wearing mask<sup>7</sup>, since 48 hours before the symptoms' onset. This means that, with very low exceptions, people not in close contacts are not selected. And yet, our estimation of how many people are detected from the total in Catalonia for example (the case we know better) clearly indicated a diagnosis rate larger than 70 %, maybe even closer to 80 %.

**There is strong evidence then that the great majority of cases are related with infection produced at short distance.** We have looked for corroboration in the literature. Indeed, we have not found, so far, any case where it has been clearly demonstrated that infections happened at more than 5 meters. However, there are examples of infections in the 2m-5m range in settings with high voice/singing and low ventilation<sup>8</sup>. Given the difficulty in finding situations where people stood always more than 2 meters apart, the fact that they are probably a minority does not mean that they are negligible.

We can conclude that wearing mask in public in indoor settings like shops, supermarkets or even at work at higher rates probably confers an advantage to Spaniards in preventing 2-5m infections and reduces the risk of infection in case there are agglomerations. Unfortunately, this comparative advantage can be erased if the behavior at close contact with family, friends and co-workers, where most infections occur, carries more risk in a standard dinner or meeting in Spain than in other countries.

A clear question then arises. **Are the gatherings with friends and co-workers without mask much more risky in Spain than in other countries in the different settings where they happen?** The reason for the question

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<sup>5</sup> <https://www.lamoncloa.gob.es/serviciosdeprensa/notasprensa/sanidad14/Paginas/2020/250820-estudio.aspx>

<sup>6</sup> [https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/documentos/Actualizacion\\_199\\_COVID-19.pdf](https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/documentos/Actualizacion_199_COVID-19.pdf)

<sup>7</sup> [https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/documentos/COVID19\\_Estrategia\\_vigilancia\\_y\\_control\\_e\\_indicadores.pdf](https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/documentos/COVID19_Estrategia_vigilancia_y_control_e_indicadores.pdf)

<sup>8</sup> <https://www.cdc.gov/mmwr/volumes/69/wr/mm6919e6.htm>



is clear. **Most countries report not using masks.** Spain is thus clearly not having riskier behavior in this sense. Spaniards can have riskier behavior than its European counterparts only if:

- They remain at close distance much more often without keeping the recommended distance.
- They talk loudly or shout or scream more often in those settings.

Let us advance here the conclusions. **There is indirect evidence that points to riskier behavior at close contact in Spain, but there is no way to provide a fully quantitative answer to this question. Without the details of tracing studies and contacts from European health authorities and uniform self-reporting behavioral studies is not possible to assess whether in Spain there has been riskier behavior on average than other European countries like France or Netherlands.** The evidence pointing in the direction of riskier behavior is not presently quantifiable and cannot be compared with the benefits of general mask wearing in street/supermarkets/shops. In this scenario, the relaxation of masks wearing has allowed the possibility of having a second wave and, in this sense, it has been an important factor. We must insist on this point, the relaxation of mask wearing or not keeping personal distance is a necessary condition for a second wave since without it there is no possibility of it. Nevertheless, other factors must be analyzed as well: socio-economic factors and the readiness of the tracing and quarantine process must be assessed in future reports.

Let us provide the two pieces of evidence that indicate that Spaniards might have riskier behavior in relation with distance and voice levels and how this data is difficult to quantify and compare with the advantage of wearing masks in supermarkets/street/... The best data available is a direct comparison with the Netherlands.

- 1) In Spain, family meetings are considered low risk by citizens, as indicated. This suggests that 1.5 meters distance rules are not followed generally. On the other hand, in the Netherlands, the self-evaluation of keeping 1.5 meters distance apart in gatherings has been high and slowly decreasing over time according to self-reported information. In the first round of the Research behavioral rules and well-being<sup>9</sup> a full 2/3 reported taking 1.5 m distance when receiving visitor at home. This ratio has fallen in the subsequent months (lower 12% in the second round). The key paragraph of the last survey regarding this issue is the following<sup>10</sup> :

*The number of people who find it easy or very easy to stay 1.5 meters apart decreased between April and June (from 63% to 45%). However, there has been no significant reduction since the previous survey (3 weeks earlier), despite the decision to ease the government measures. Participants indicated that they more often manage to keep their distance in the cinema or theatre (74%) and in cafés and restaurants (55%) than in the supermarket (13%) or at work (24%)*

This points to a highly self-reported compliance in family meetings and in bar terraces. However, they are not directly comparable with Spanish surveys, making it impossible to put a close number. In this line of uncertainty, inter-personal distance at which Spain feels at ease is one of the shortest in the world for strangers but not necessarily so, compared with Germany for example, when Spaniards consider someone a close person. Unfortunately, in the seminal paper in 2017 dealing with these issues *Preferred Interpersonal Distances: A Global Comparison*<sup>11</sup> there is no direct comparison between Spain and France nor Netherlands.

- 2) Spain is the country with the highest level of noise pollution. Its main cities always rank first in the international ranking which measure dB levels. Loud conversation in the streets are either the cause or the consequence (or both) of noise pollution. Spaniards speaking loudly is, at the bare minimum, a well-known stereotype well rooted in this fact of Spanish outdoor life. However, despite the

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<sup>9</sup> <https://www.rivm.nl/en/novel-coronavirus-covid-19/research/behaviour/behavioural-measures-and-well-being/round-1>

<sup>10</sup> <https://www.rivm.nl/en/novel-coronavirus-covid-19/research/behaviour/behavioural-rules-and-well-being-round-4>

<sup>11</sup> <https://journals.sagepub.com/doi/abs/10.1177/0022022117698039there>

relevance of the question, we have not found any quantitative study that show how louder Spanish speak in family meetings and gatherings with friends indoors compared with other countries. This is especially important given that Spaniards do speak faster<sup>12</sup> which could lead to different perceptions.

We should notice, however, that even if we could have data about dB levels in indoor meetings in Spain, as we have for outdoors, and compare it with France or Netherlands, the lack of data from the analysis of contacts and infection location would not allow us to check if both pieces of evidence point, at least, in the same direction. More importantly, we would not have comparable survey results of how often they did have a family meeting that can be used as the reference point.

Taking into account all this, the final conclusion of this assessment is to provide one recommendation:

It is well known **the importance in making public and available the data on contact tracing to know where the detection infections are happening** in order to explain better how and when infection happen and how to prevent it, both using public health measures and messages which try to change personal behavior. We must include the recommendation that **self-reported surveys of behaviors are also key and they should be as uniform as possible in order to allow for comparison**. We think that this would help to advance the research of the main environments/settings where infections happen and why.

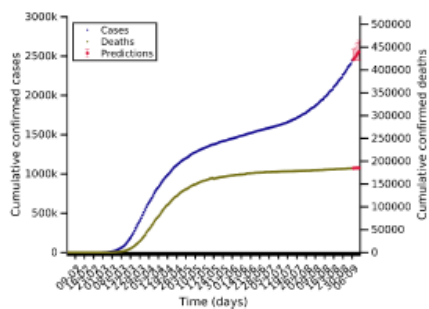
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<sup>12</sup> <https://advances.sciencemag.org/content/5/9/eaaw2594>

## Legend: Countries' reports details

Reported cumulative cases (blue) and deaths (brown), together with predictions (red)

EU+EFTA+UK 06-09-2020. Pop: 2632.4M. Cumulative incidence: 93/10<sup>5</sup>

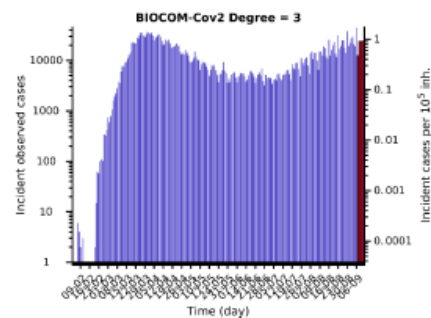
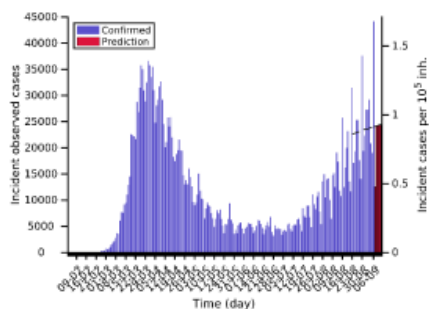


Predictions for next days		
Day	Number of cases	95% confidence interval
07-09-2020	2458068 (+125771)	[ 2445493 - 2586148 ]
09-09-2020	2568527 (+242758)	[ 2440483 - 2638980 ]
11-09-2020	2553558 (+244355)	[ 2440483 - 2798209 ]

Current indicators		
$R_{eff}$	RPI	CFR
1.3	14	1.17 %

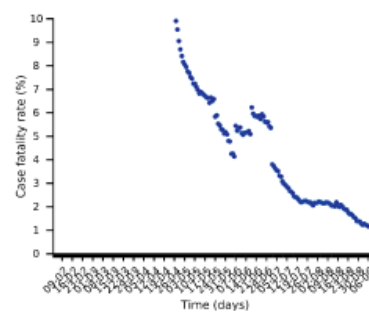
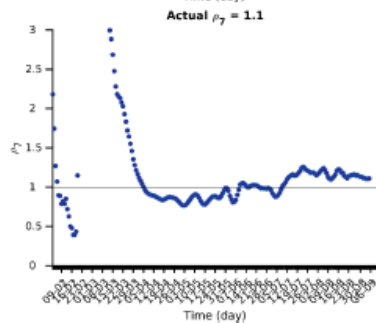
Predictions and indicators

Incident observed cases and predictions.



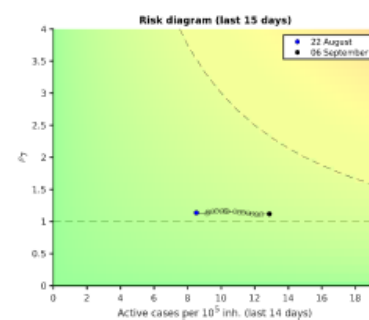
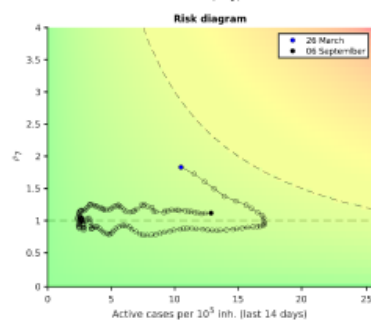
Incident observed cases in a logarithmic scale, with Biocom-Cov degree.

Evolution of empiric reproduction number  $\rho_T$



Case fatality rate

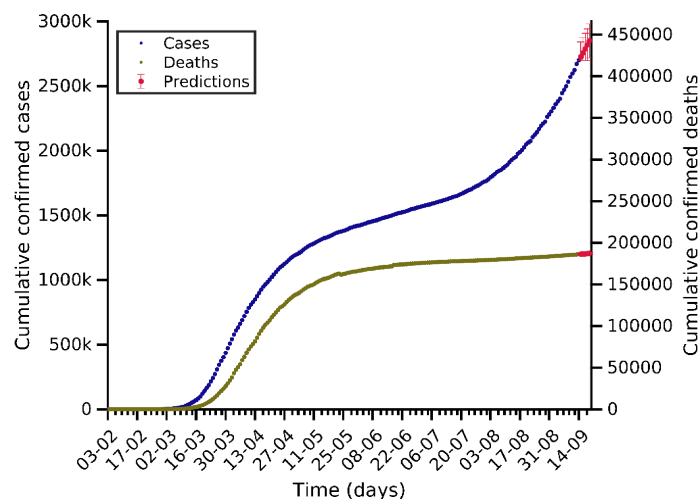
Risk diagram



Risk diagram of last 15 days

**(1) Analysis and prediction of COVID-19  
for EU+EFTA+UK**

# EU+EFTA+UK 14-09-2020. Pop: 2564.4M. Cumulative incidence: 105/10<sup>5</sup>

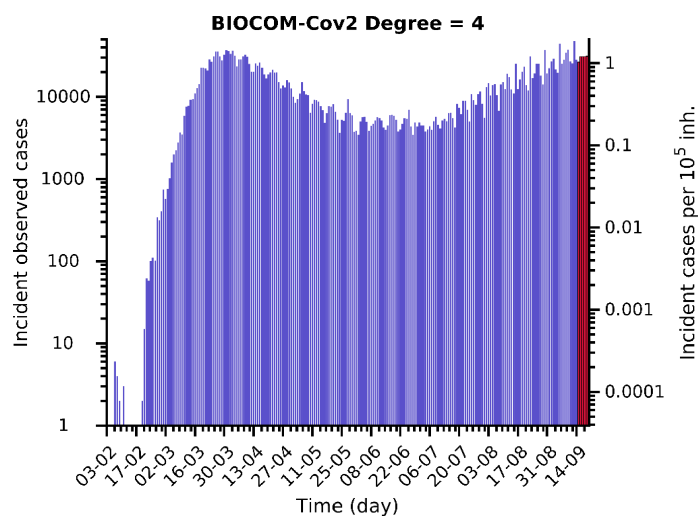
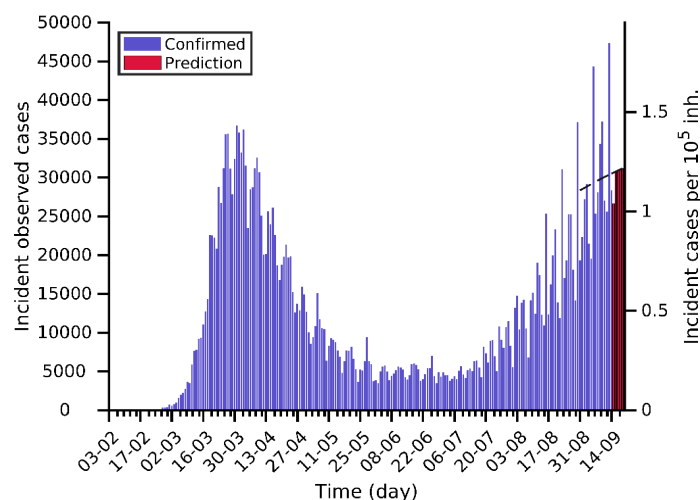


Predictions for next days

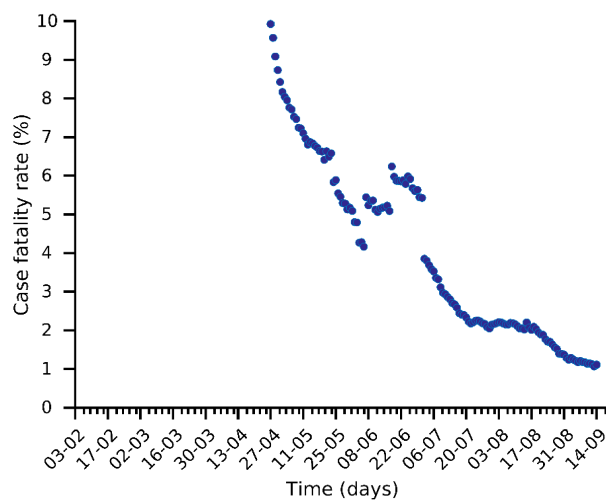
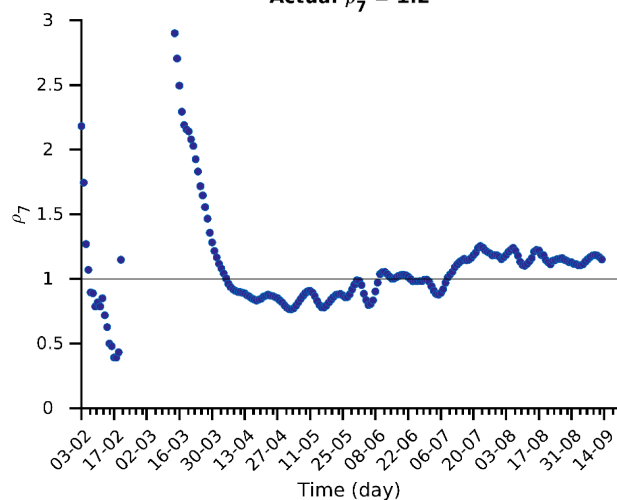
Day	Number of cases	95% Confidence Interval
15-09-2020	2725998 (+26641)	[ 2699357 - 2841738 ]
17-09-2020	2787721 (+30930)	[ 2699357 - 2908286 ]
19-09-2020	2849990 (+31202)	[ 2718867 - 2981112 ]

Current indicators

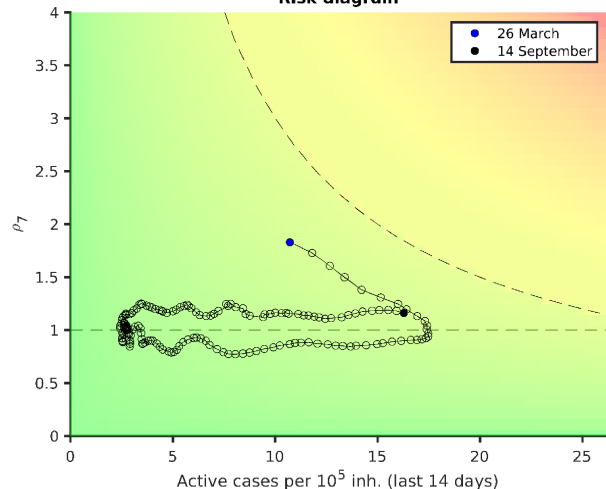
A <sub>14</sub>	EPG	CFR
16	19	1.11 %



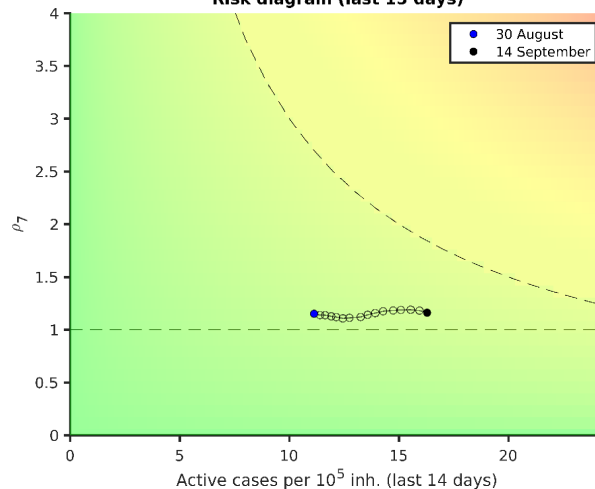
Actual  $\rho_7 = 1.2$



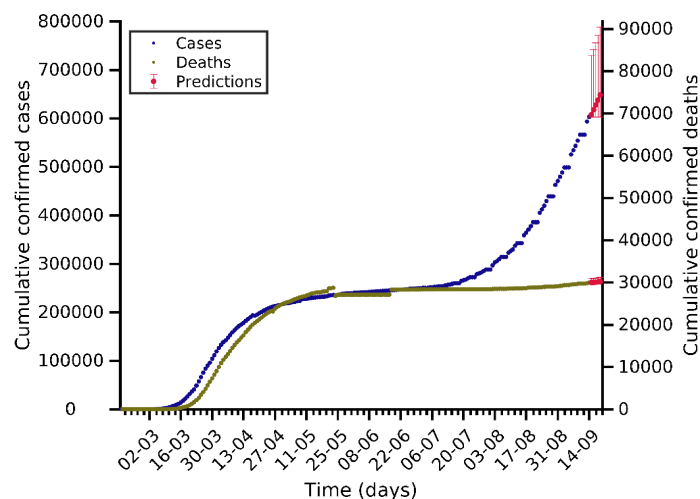
Risk diagram



Risk diagram (last 15 days)



# Spain 14-09-2020. Pop: 47.0M. Cumulative incidence: 1283/10<sup>5</sup>

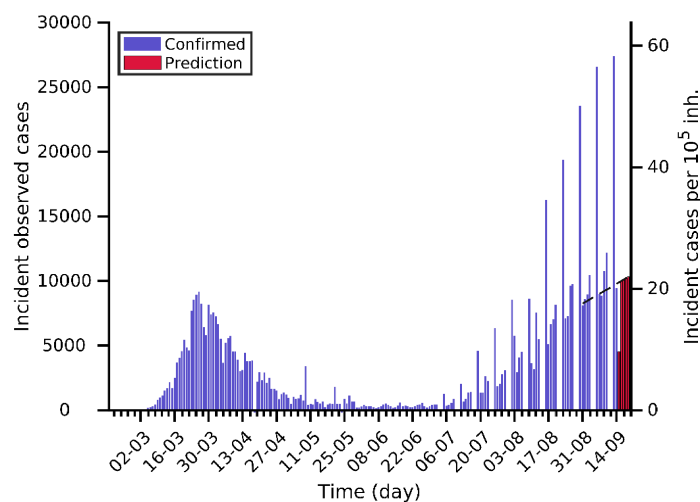


Predictions for next days

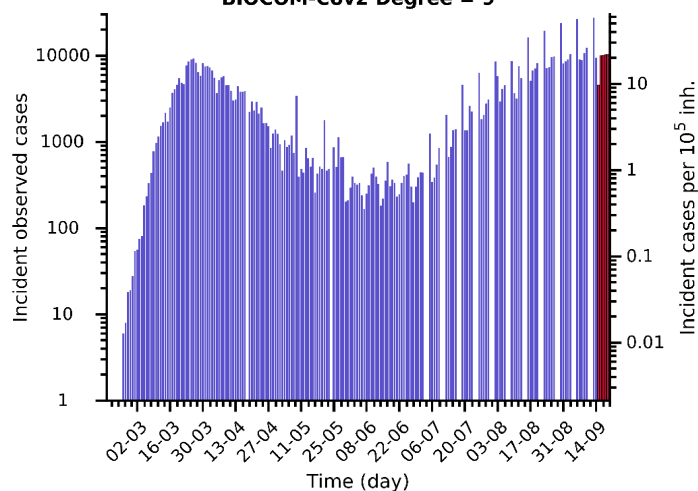
Day	Number of cases	95% Confidence Interval
15-09-2020	607702 (+4535)	[ 603167 - 730213 ]
17-09-2020	627809 (+10110)	[ 603167 - 755793 ]
19-09-2020	648370 (+10337)	[ 603167 - 788660 ]

Current indicators

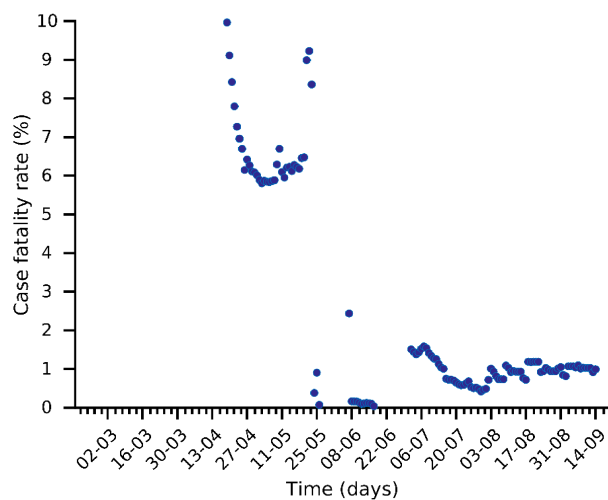
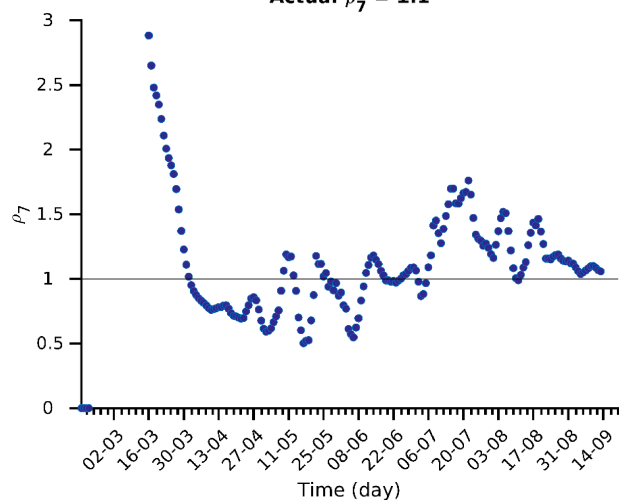
A <sub>14</sub>	EPG	CFR
281	297	0.99 %



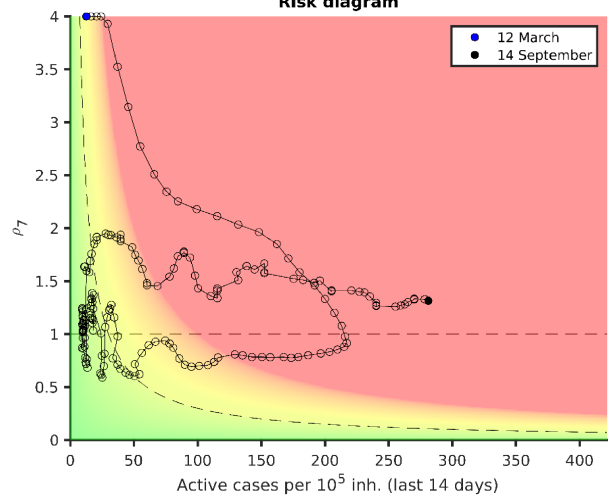
BIOCOM-Cov2 Degree = 9



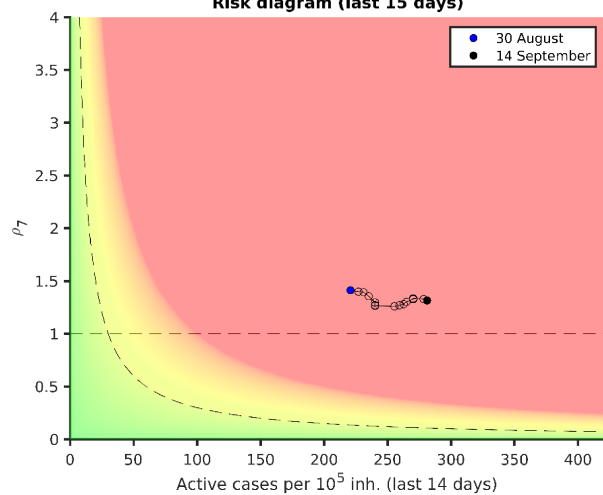
Actual  $\rho_7 = 1.1$



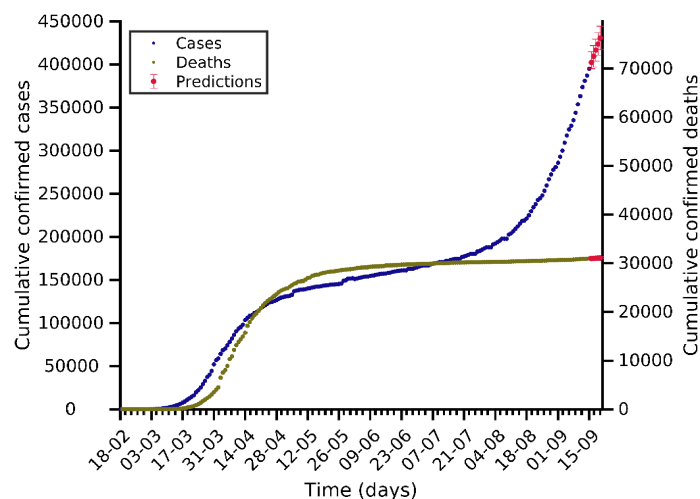
Risk diagram



Risk diagram (last 15 days)



# France 15-09-2020. Pop: 65.3M. Cumulative incidence: 605/10<sup>5</sup>

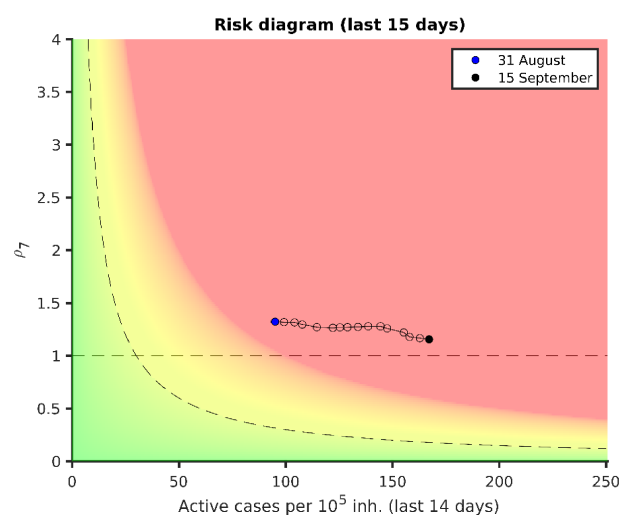
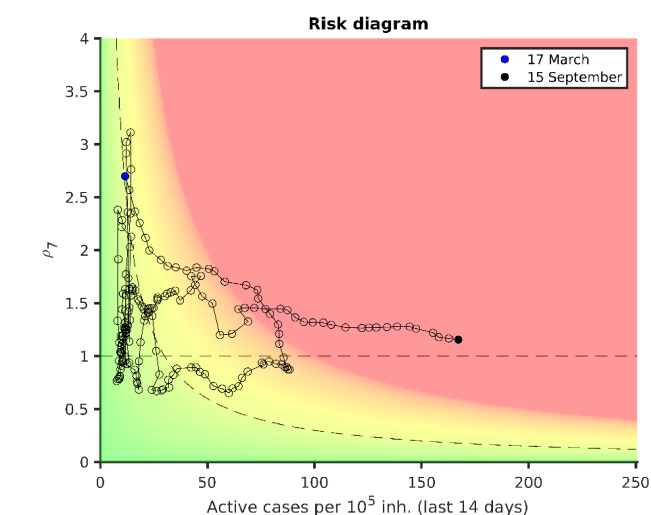
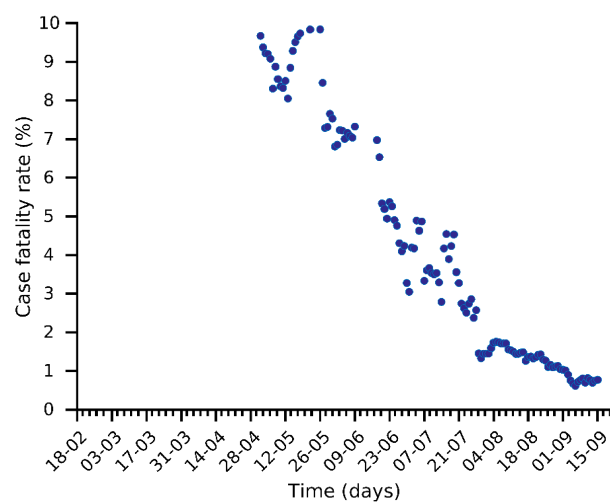
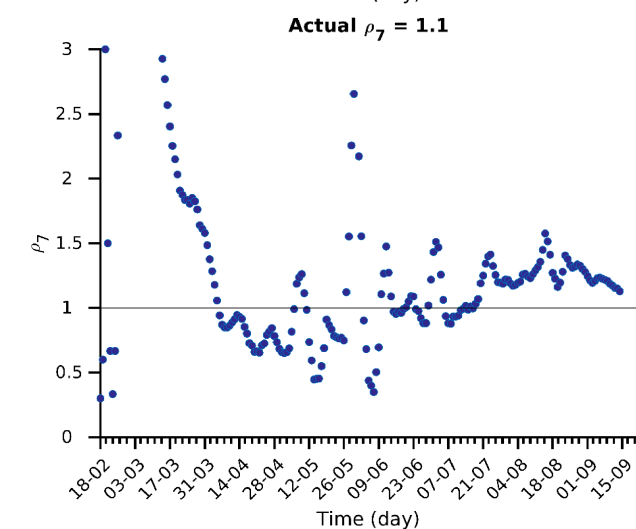
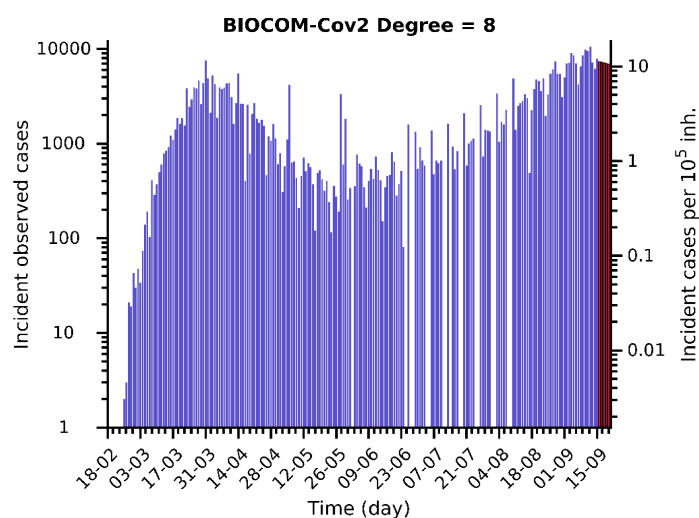
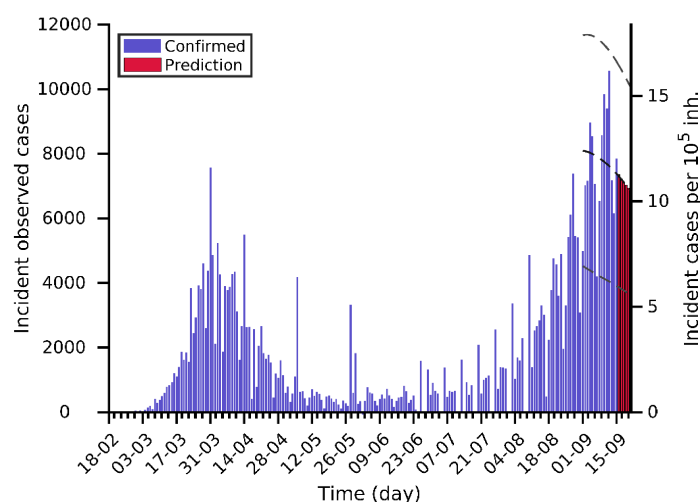


Predictions for next days

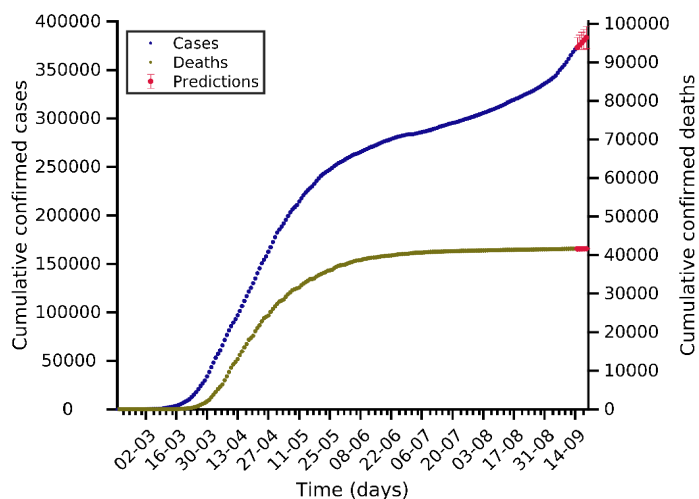
Day	Number of cases	95% Confidence Interval
16-09-2020	402458 (+7354)	[ 395104 - 414767 ]
18-09-2020	416790 (+7121)	[ 404011 - 429570 ]
20-09-2020	430753 (+6934)	[ 416991 - 444516 ]

Current indicators

A <sub>14</sub>	EPG	CFR
167	189	0.77 %



# UK 14-09-2020. Pop: 67.9M. Cumulative incidence: 547/10<sup>5</sup>

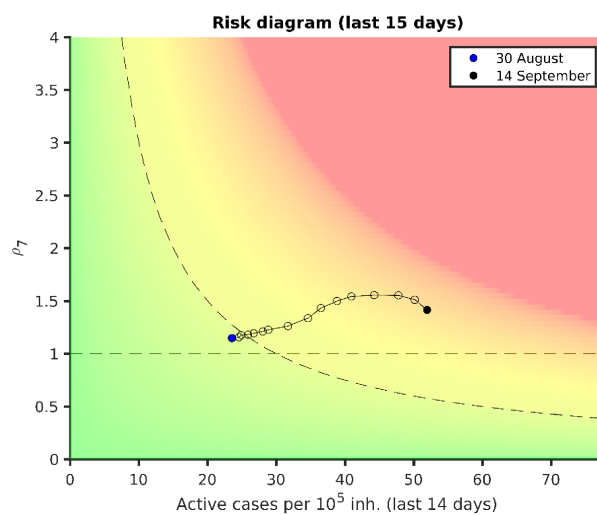
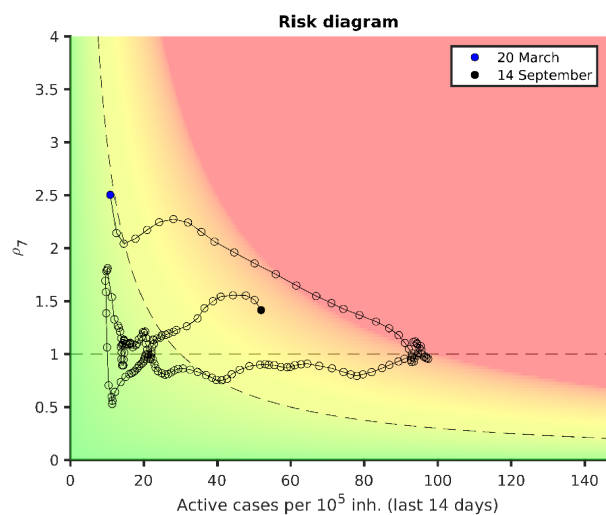
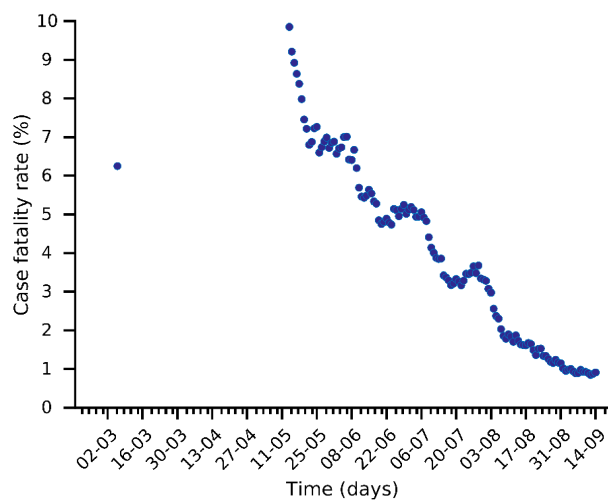
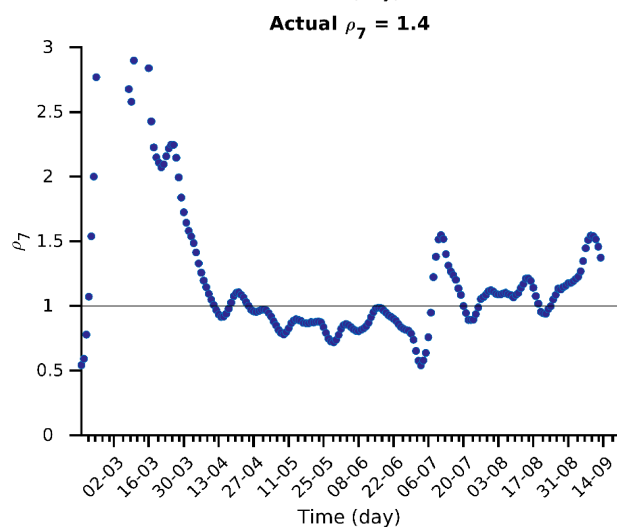
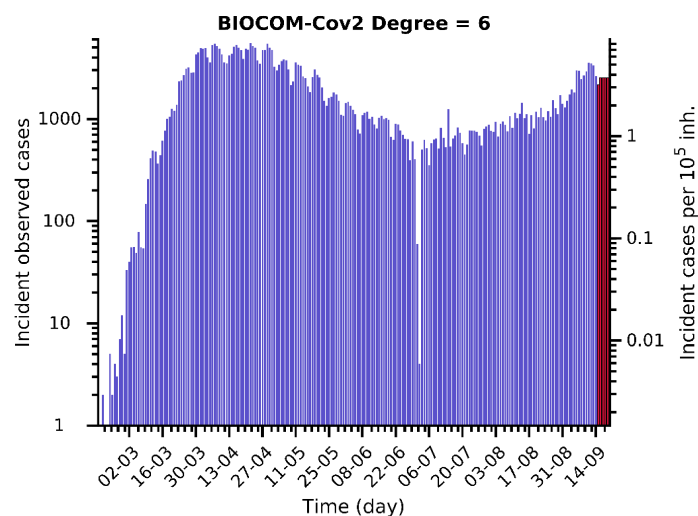
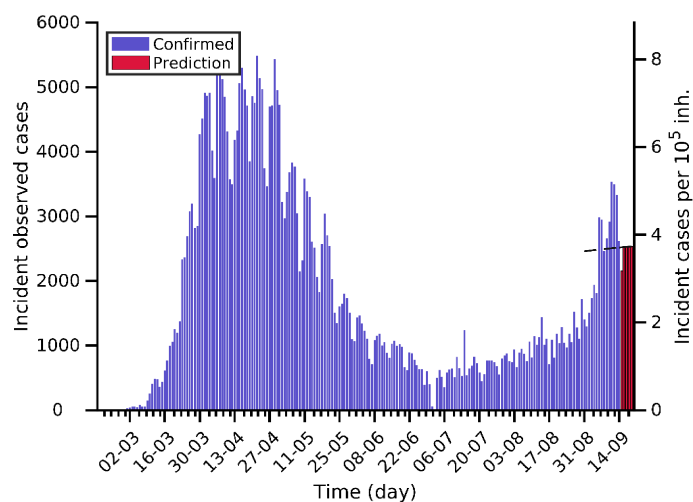


Predictions for next days

Day	Number of cases	95% Confidence Interval
15-09-2020	373281 (+2156)	[ 371125 - 383402 ]
17-09-2020	378334 (+2528)	[ 371125 - 388860 ]
19-09-2020	383401 (+2535)	[ 372004 - 394798 ]

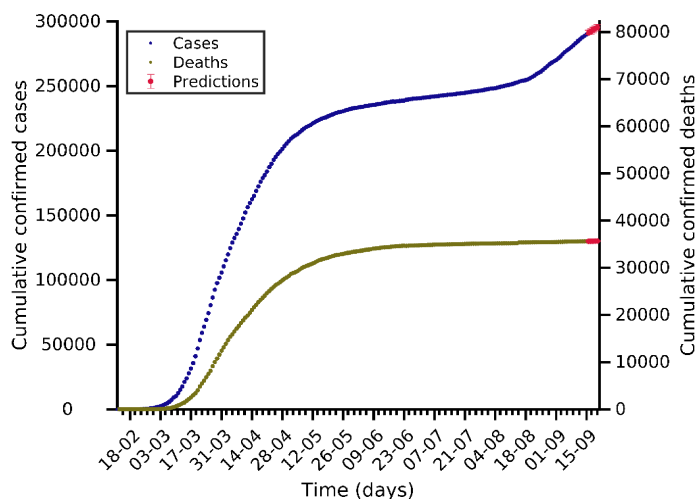
Current indicators

A <sub>14</sub>	EPG	CFR
52	71	0.91 %





# Italy 15-09-2020. Pop: 60.5M. Cumulative incidence: 480/10<sup>5</sup>

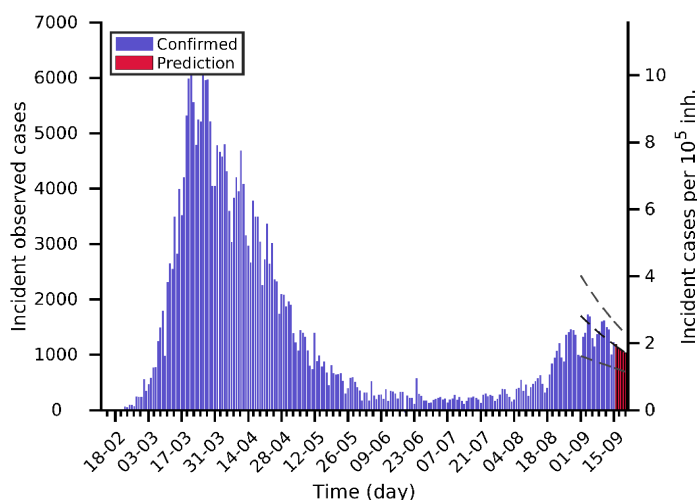


Predictions for next days

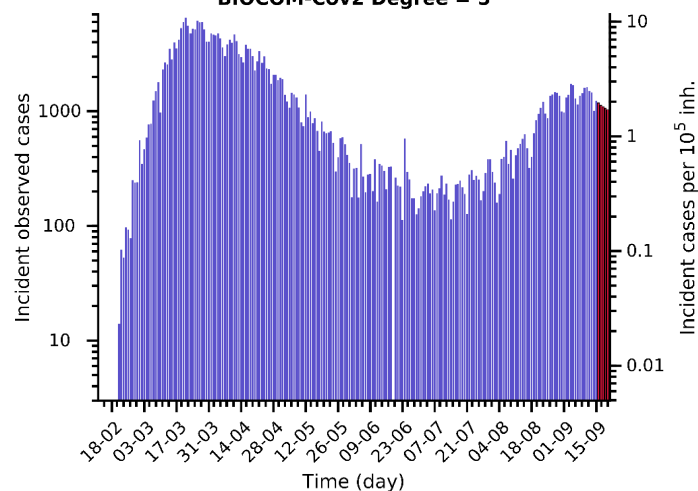
Day	Number of cases	95% Confidence Interval
16-09-2020	291175 (+1185)	[ 289990 - 293224 ]
18-09-2020	293394 (+1094)	[ 291280 - 295507 ]
20-09-2020	295494 (+1036)	[ 293253 - 297735 ]

Current indicators

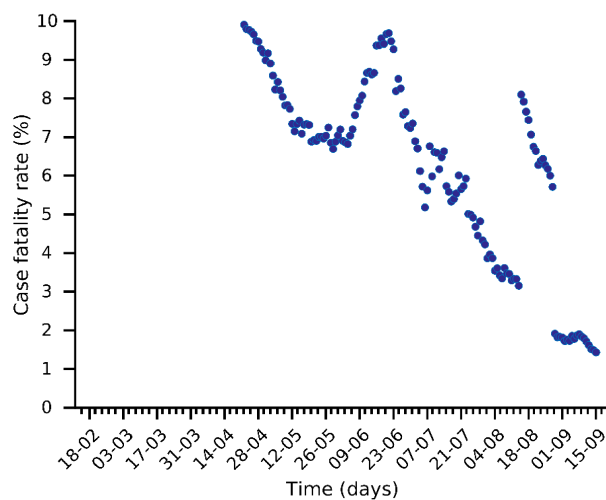
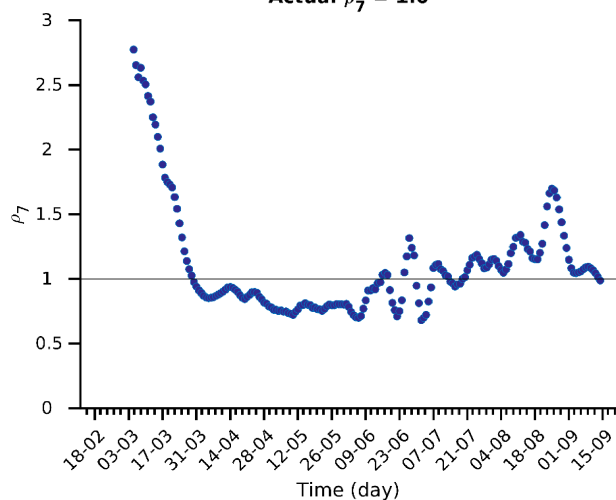
A <sub>14</sub>	EPG	CFR
33	32	1.43 %



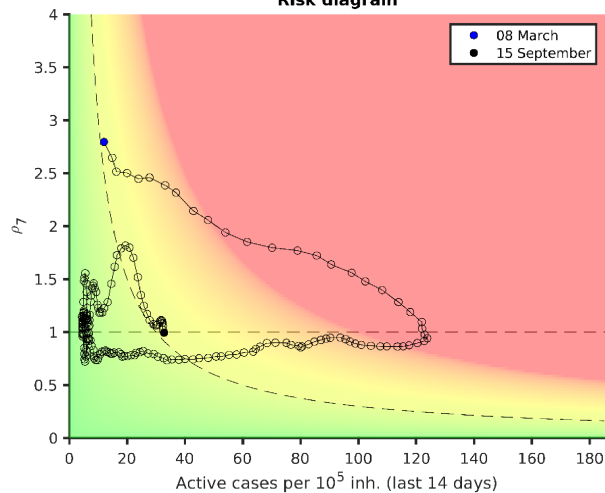
BIOCOM-Cov2 Degree = 5



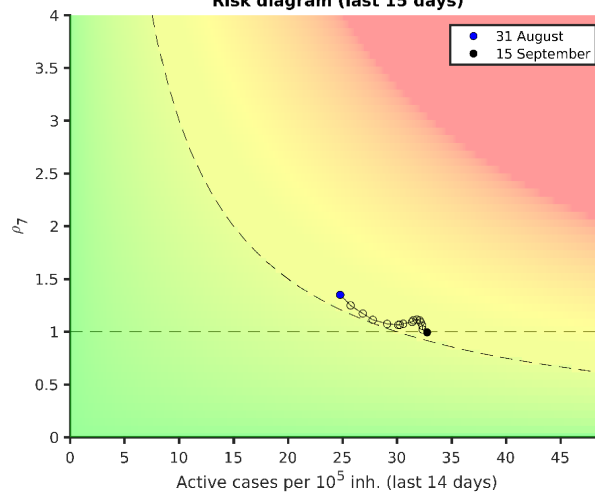
Actual  $\rho_7 = 1.0$



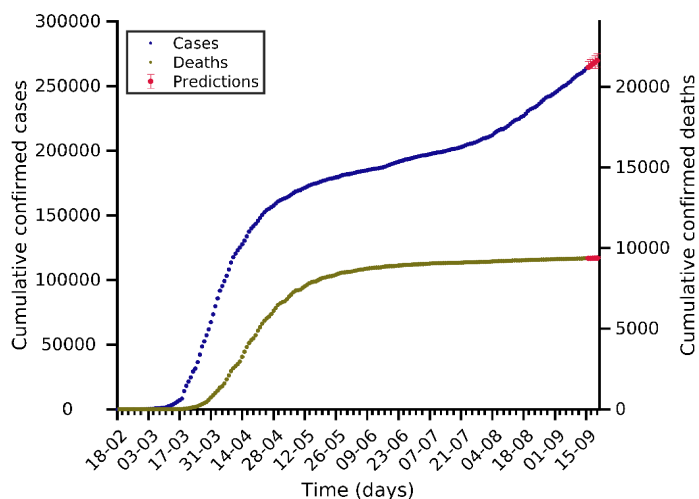
Risk diagram



Risk diagram (last 15 days)



# Germany 15-09-2020. Pop: 83.8M. Cumulative incidence: 315/10<sup>5</sup>

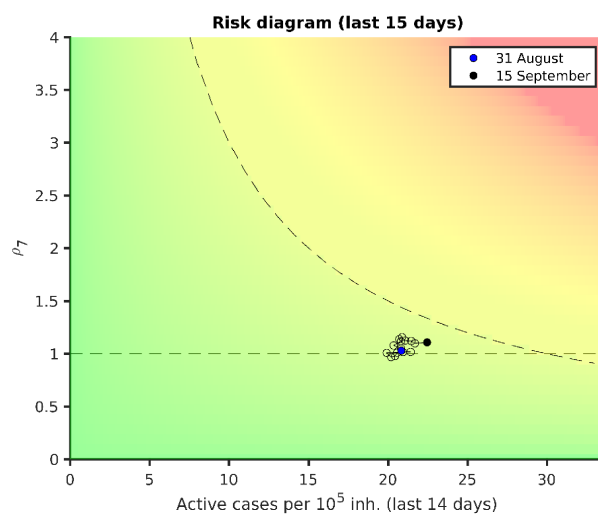
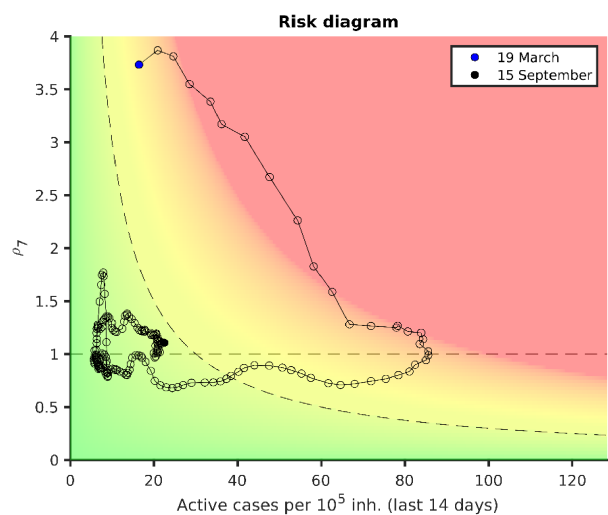
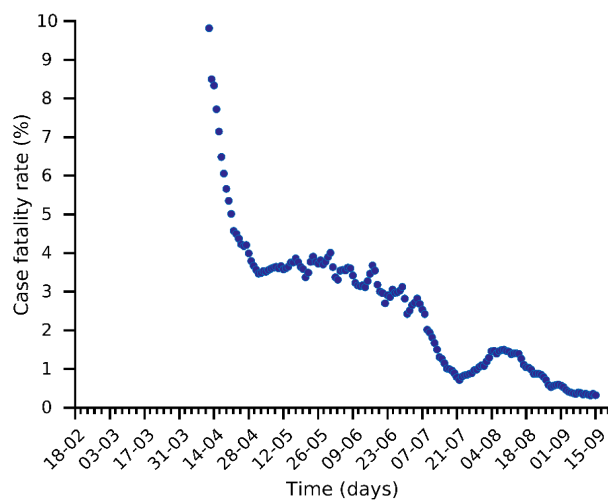
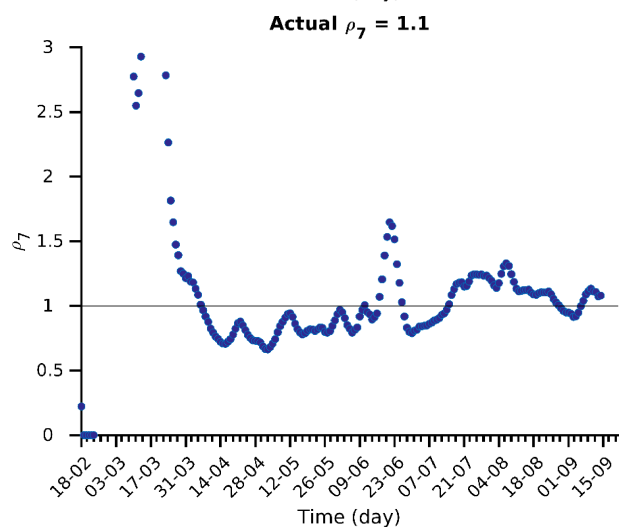
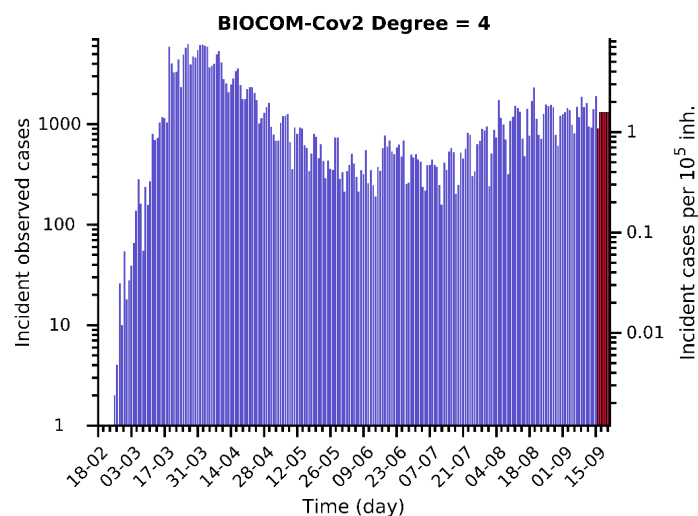
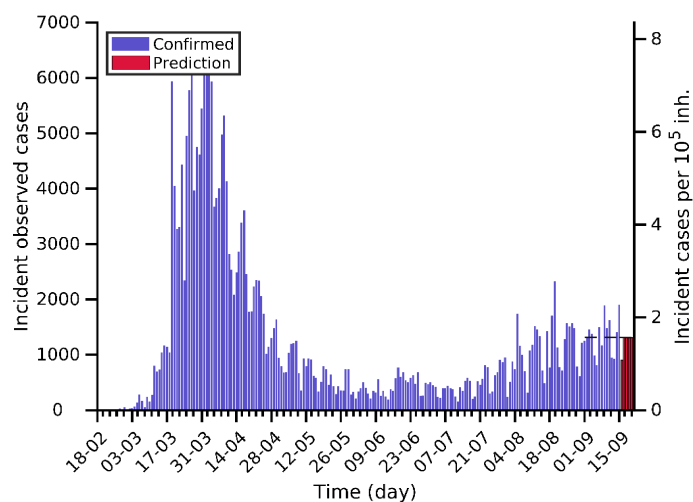


Predictions for next days

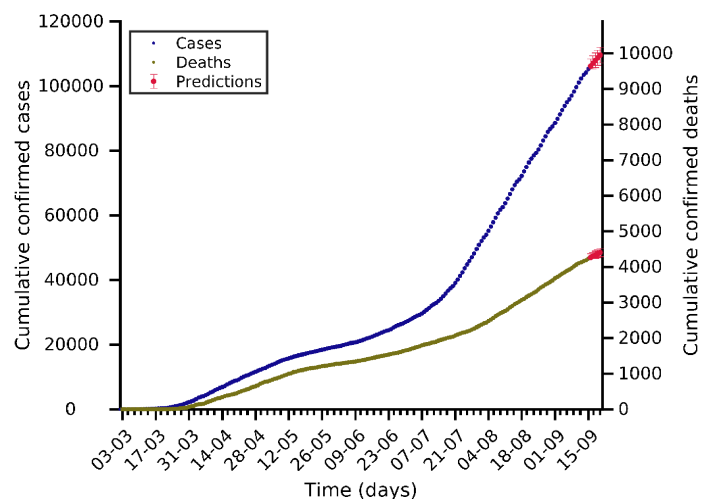
Day	Number of cases	95% Confidence Interval
16-09-2020	264569 (+906)	[ 263663 - 269088 ]
18-09-2020	267194 (+1312)	[ 263663 - 271890 ]
20-09-2020	269817 (+1311)	[ 264742 - 274892 ]

Current indicators

A <sub>14</sub>	EPG	CFR
22	24	0.32 %



# Romania 15-09-2020. Pop: 19.2M. Cumulative incidence: 547/10<sup>5</sup>

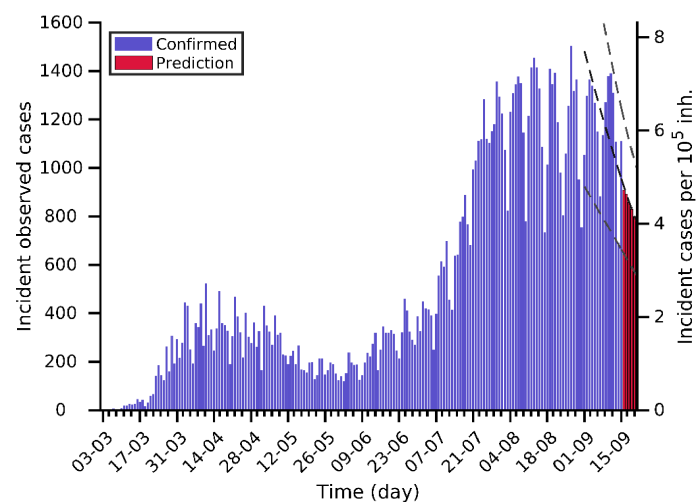


Predictions for next days

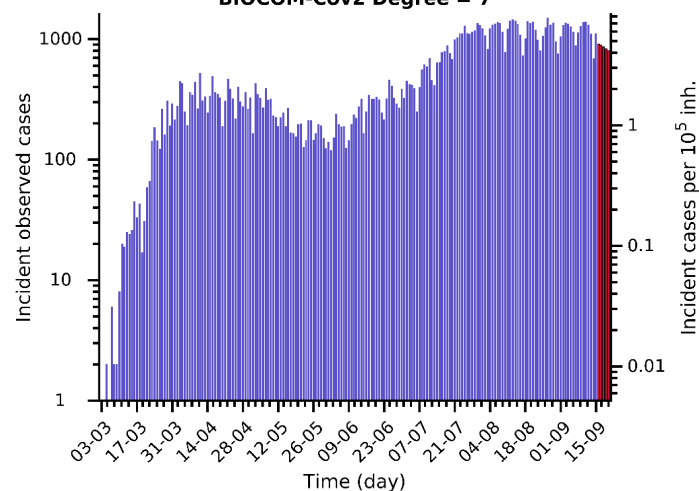
Day	Number of cases	95% Confidence Interval
16-09-2020	106207 (+909)	[ 105298 - 108411 ]
18-09-2020	107958 (+860)	[ 105686 - 110229 ]
20-09-2020	109586 (+799)	[ 107185 - 111988 ]

Current indicators

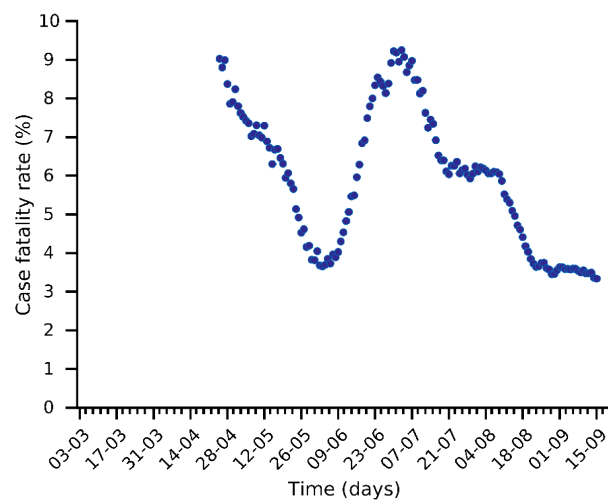
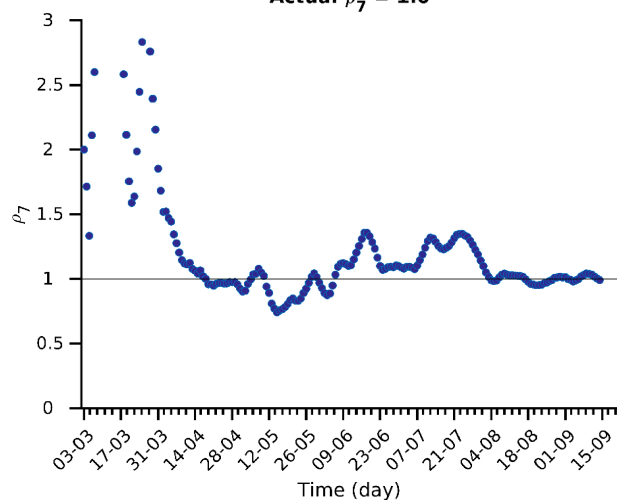
A <sub>14</sub>	EPG	CFR
87	86	3.34 %



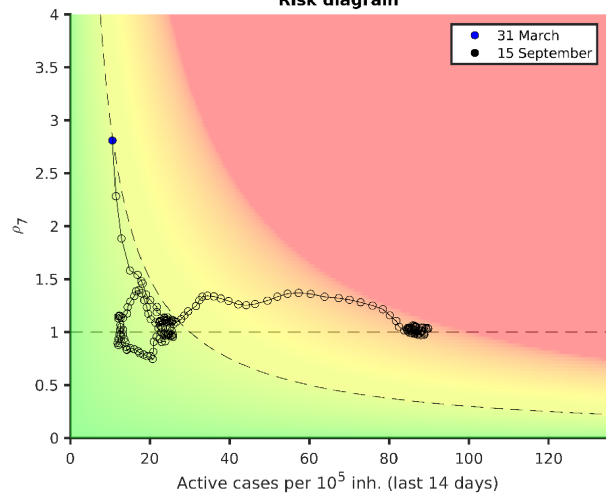
BIOCOM-Cov2 Degree = 7



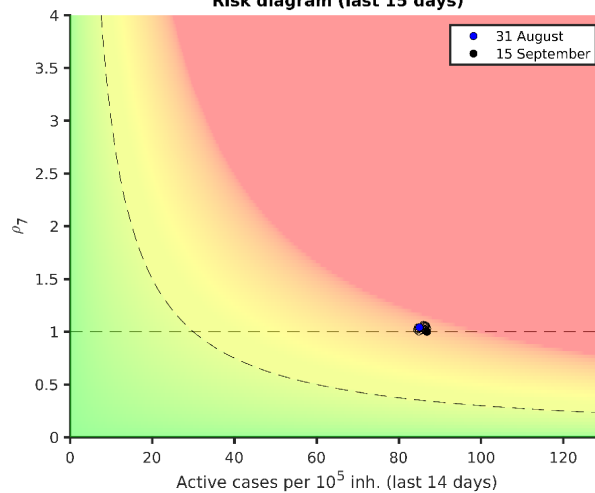
Actual  $\rho_7 = 1.0$



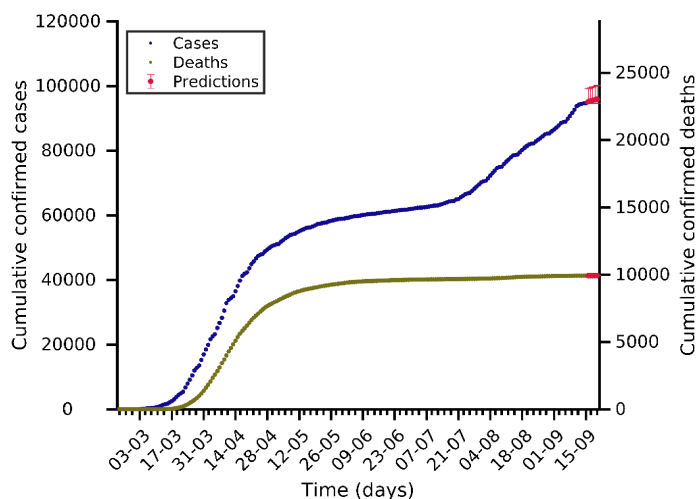
Risk diagram



Risk diagram (last 15 days)



# Belgium 15-09-2020. Pop: 11.6M. Cumulative incidence: 817/10<sup>5</sup>

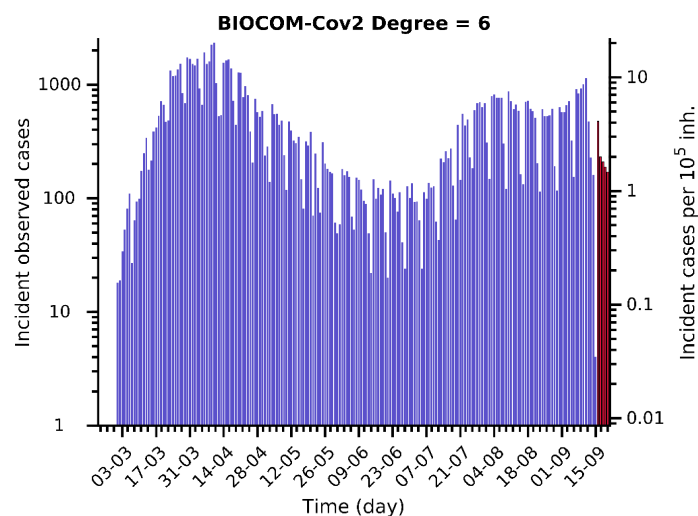
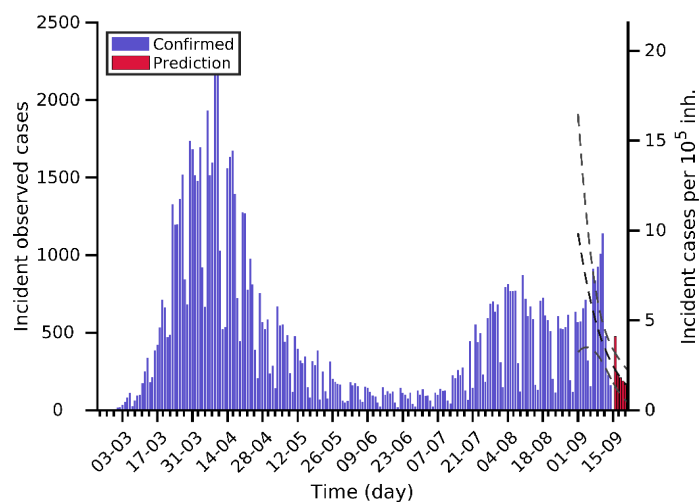


Predictions for next days

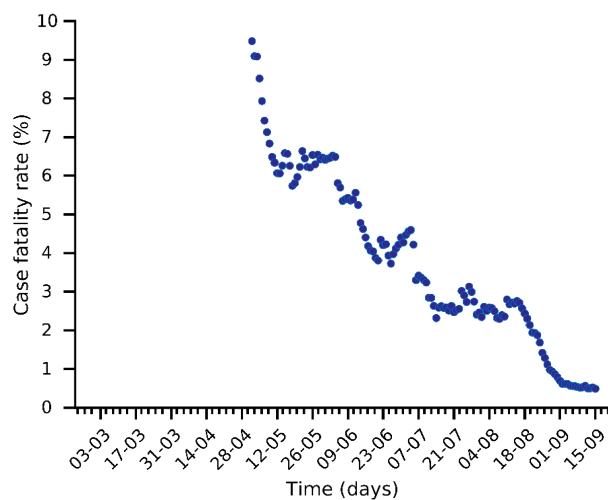
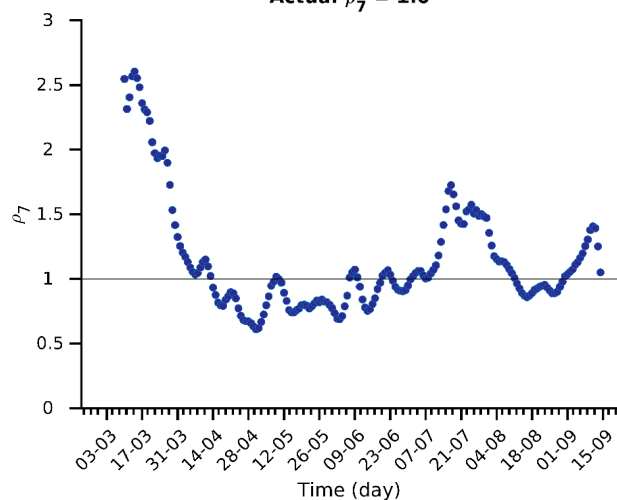
Day	Number of cases	95% Confidence Interval
16-09-2020	95176 (+475)	[ 94701 - 99221 ]
18-09-2020	95617 (+209)	[ 94701 - 99729 ]
20-09-2020	95975 (+170)	[ 94701 - 100191 ]

Current indicators

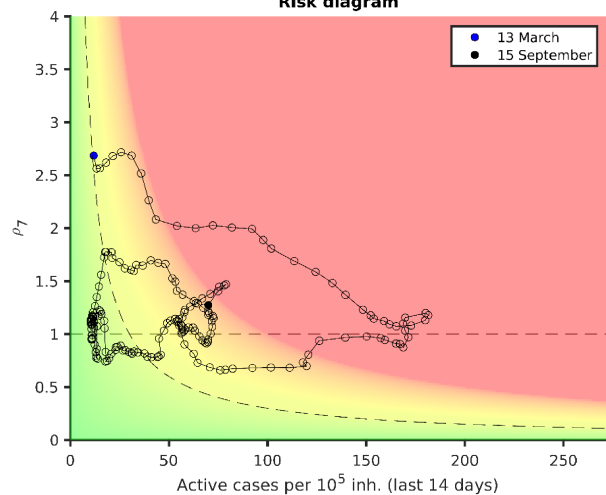
A <sub>14</sub>	EPG	CFR
70	73	0.49 %



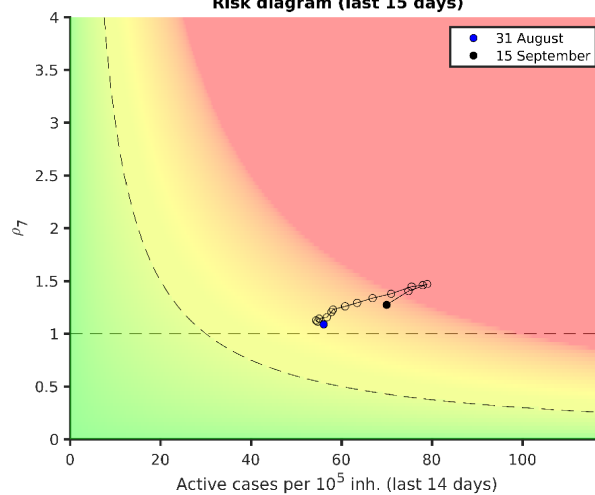
Actual  $\rho_7 = 1.0$



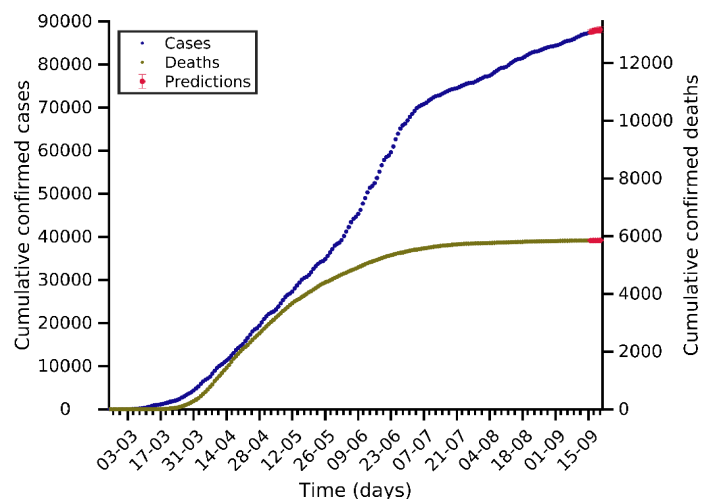
Risk diagram



Risk diagram (last 15 days)



# Sweden 15-09-2020. Pop: 10.1M. Cumulative incidence: 865/10<sup>5</sup>

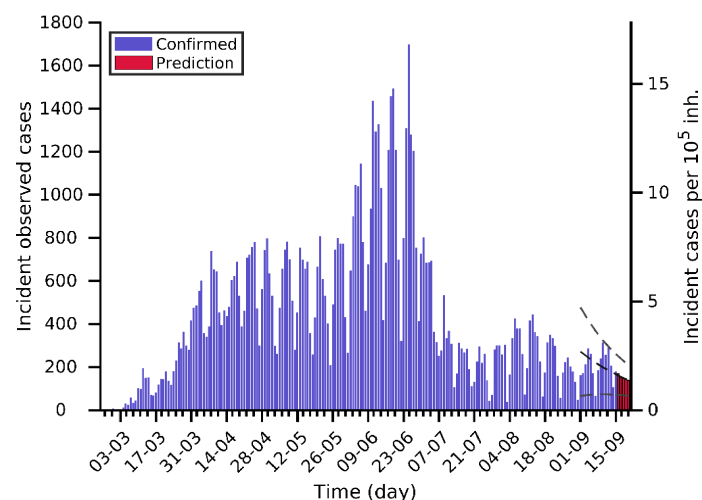


Predictions for next days

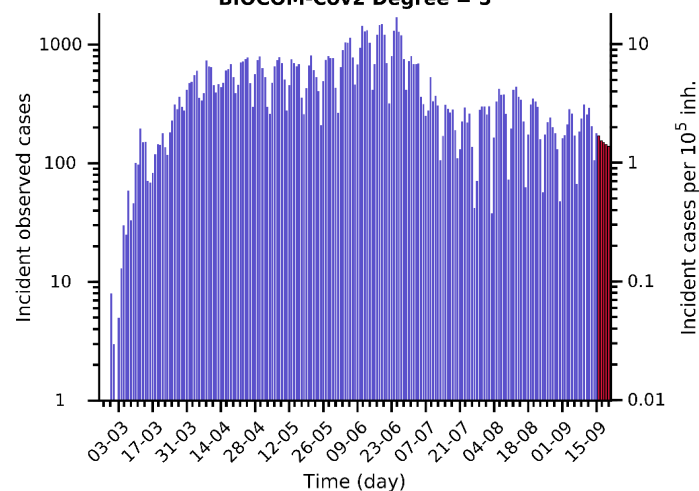
Day	Number of cases	95% Confidence Interval
16-09-2020	87515 (+170)	[ 87345 - 88157 ]
18-09-2020	87819 (+150)	[ 87345 - 88480 ]
20-09-2020	88103 (+139)	[ 87406 - 88800 ]

Current indicators

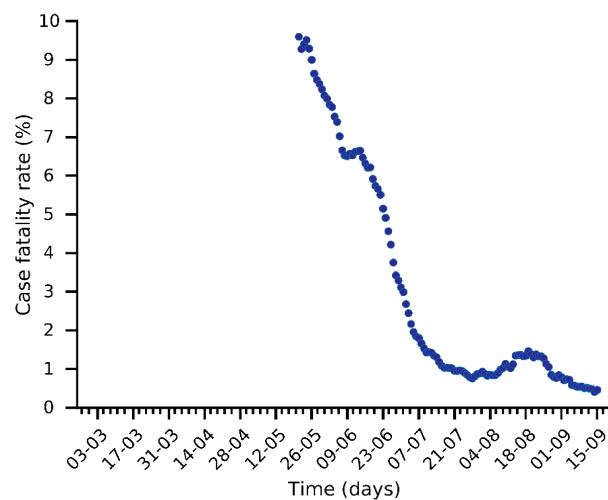
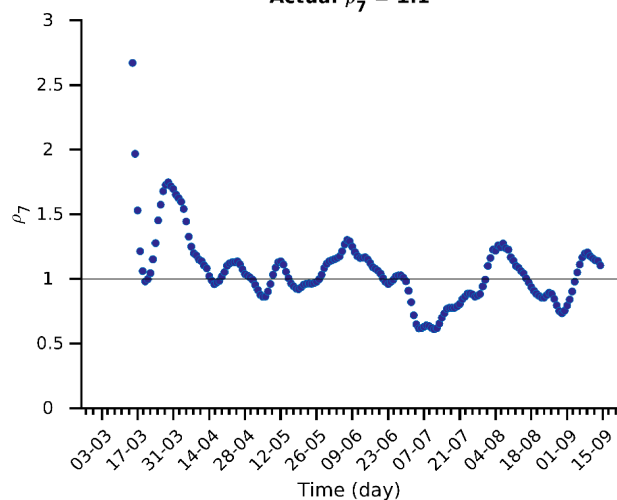
A <sub>14</sub>	EPG	CFR
29	32	0.46 %



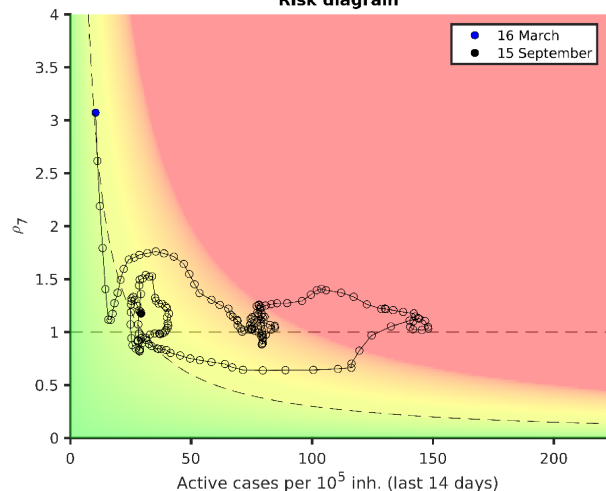
BIOCOM-Cov2 Degree = 5



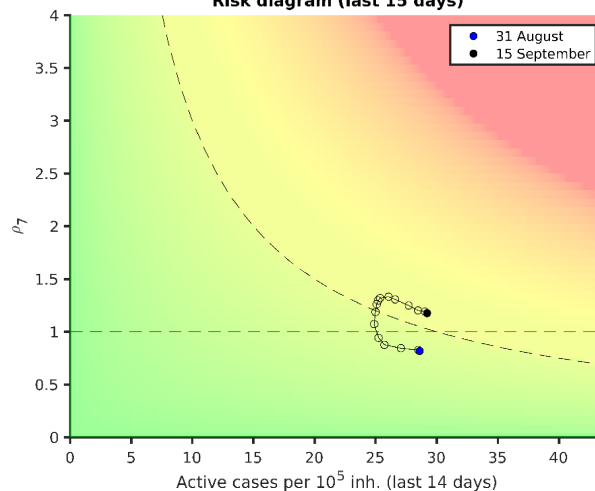
Actual  $\rho_7 = 1.1$



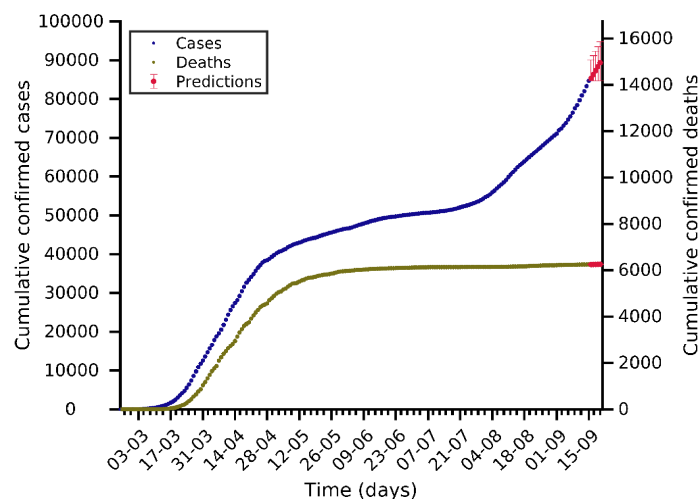
Risk diagram



Risk diagram (last 15 days)



# Netherlands 15-09-2020. Pop: 17.1M. Cumulative incidence: 494/10<sup>5</sup>

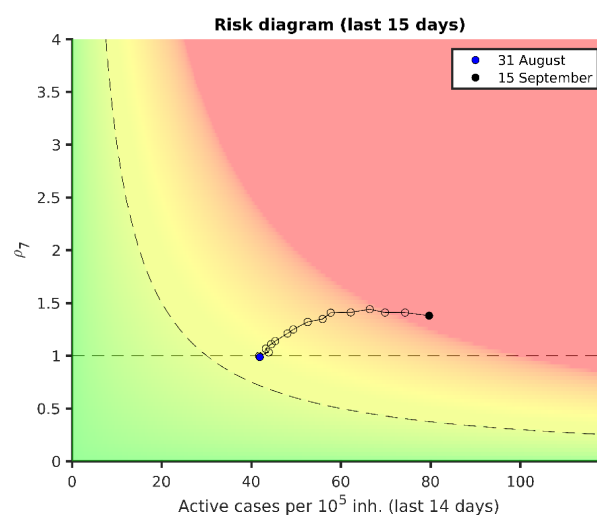
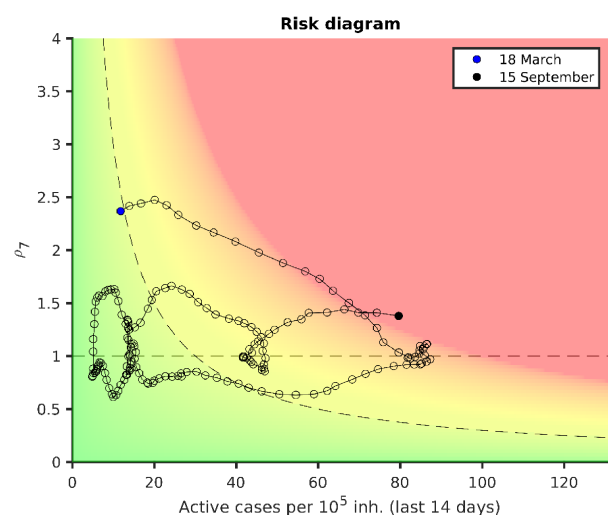
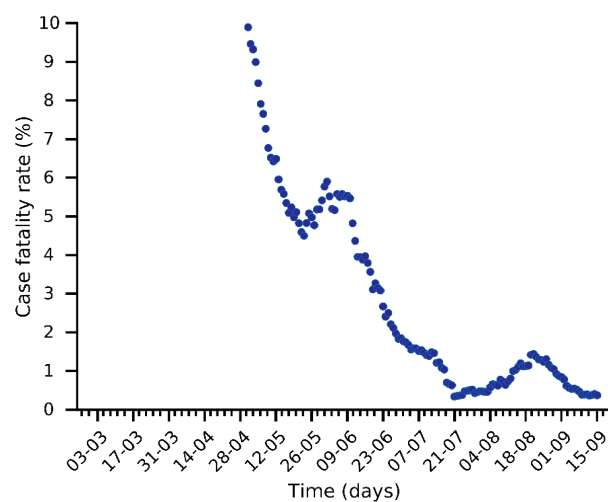
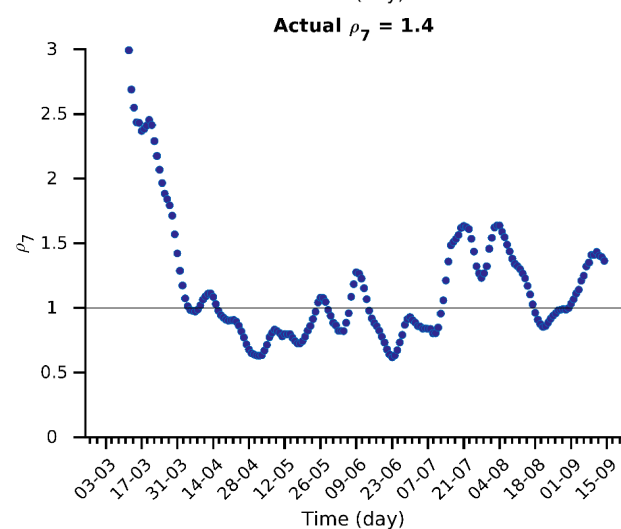
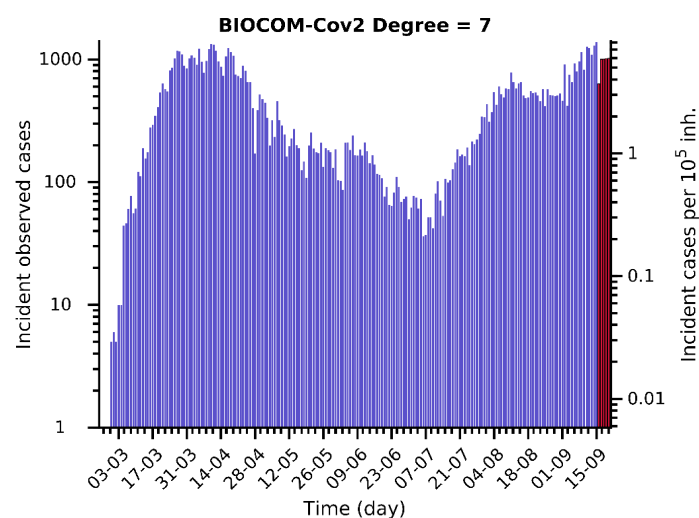
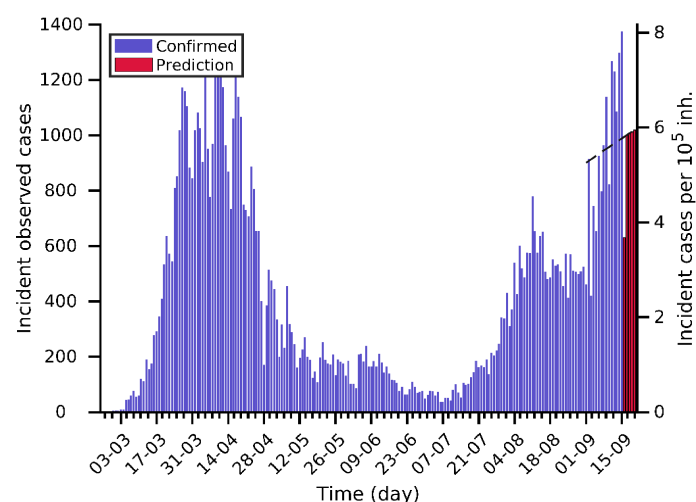


Predictions for next days

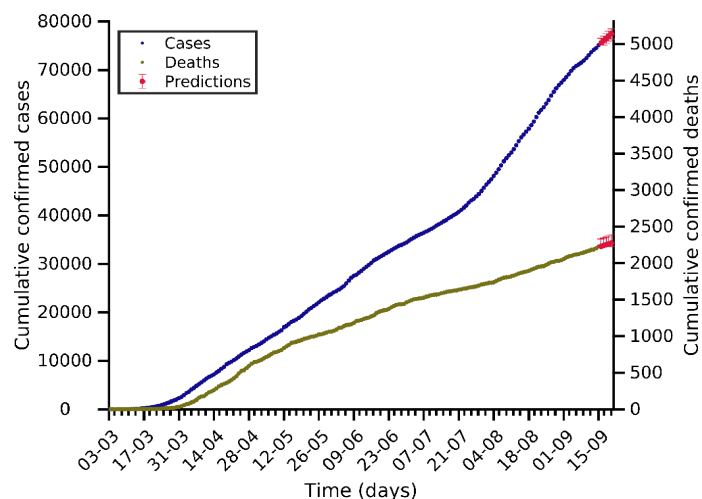
Day	Number of cases	95% Confidence Interval
16-09-2020	85328 (+631)	[ 84697 - 90110 ]
18-09-2020	87336 (+1007)	[ 84697 - 92320 ]
20-09-2020	89368 (+1019)	[ 84697 - 94796 ]

Current indicators

A <sub>14</sub>	EPG	CFR
80	109	0.37 %



# Poland 15-09-2020. Pop: 37.8M. Cumulative incidence: 199/10<sup>5</sup>

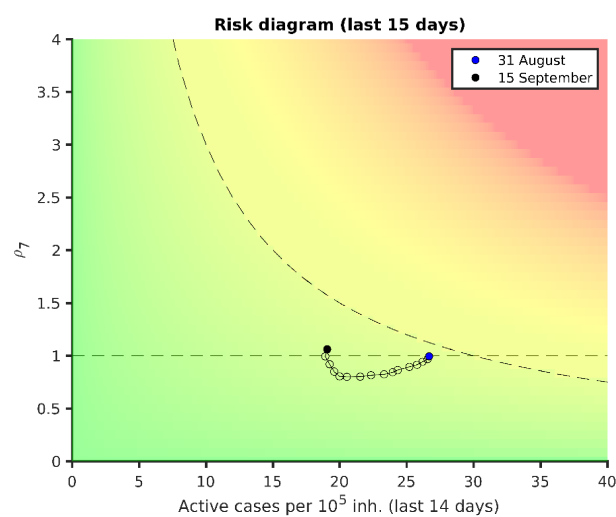
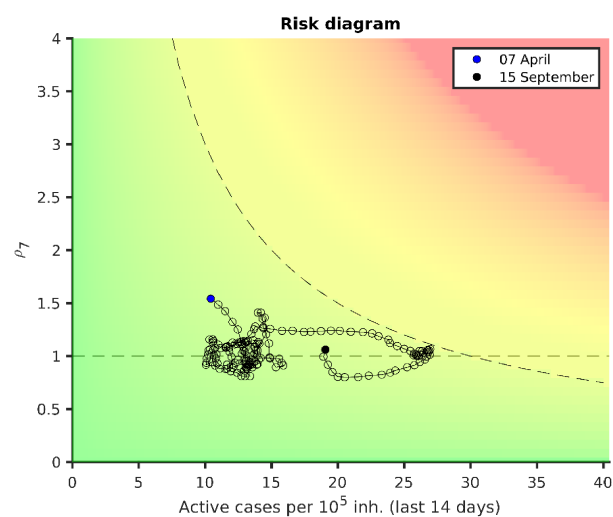
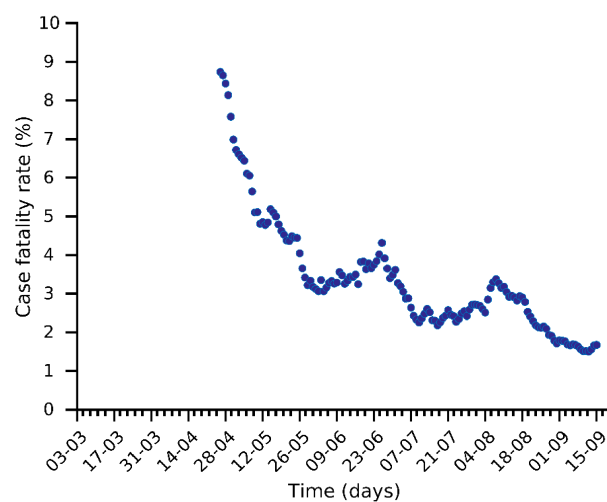
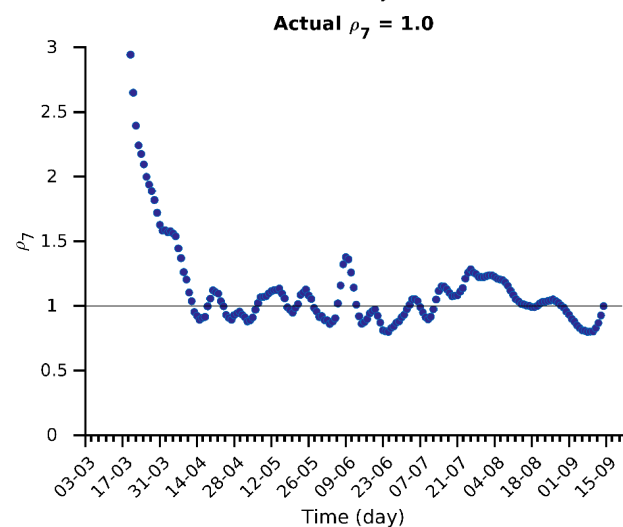
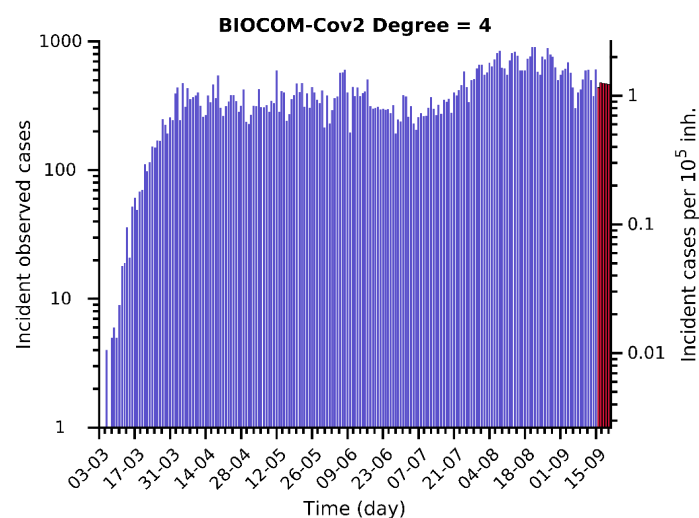
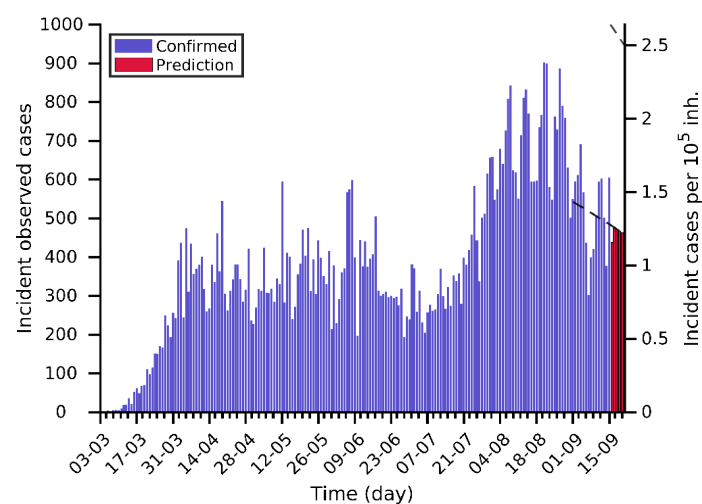


Predictions for next days

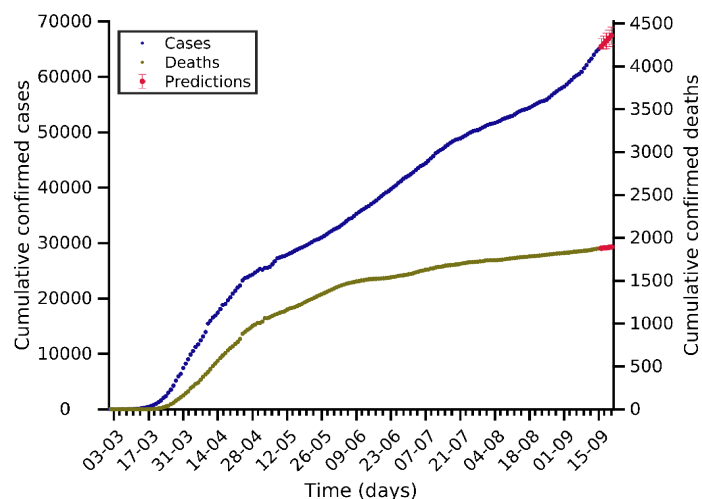
Day	Number of cases	95% Confidence Interval
16-09-2020	75572 (+438)	[ 75134 - 76519 ]
18-09-2020	76520 (+472)	[ 75538 - 77502 ]
20-09-2020	77451 (+463)	[ 76396 - 78505 ]

Current indicators

A <sub>14</sub>	EPG	CFR
19	19	1.67 %



# Portugal 15-09-2020. Pop: 10.2M. Cumulative incidence: 638/10<sup>5</sup>

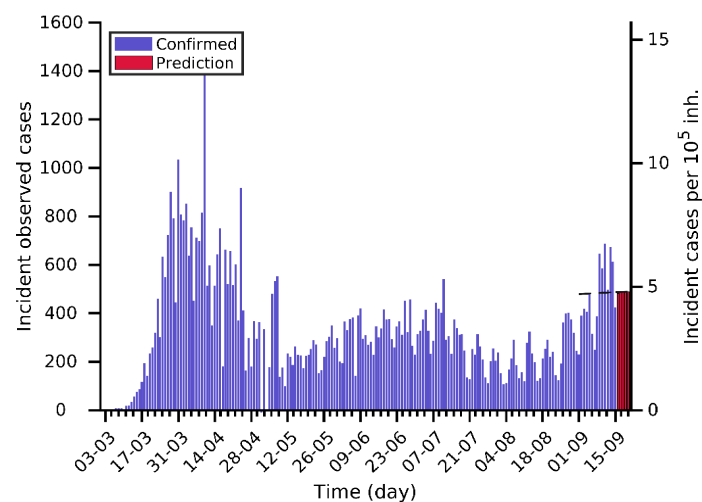


Predictions for next days

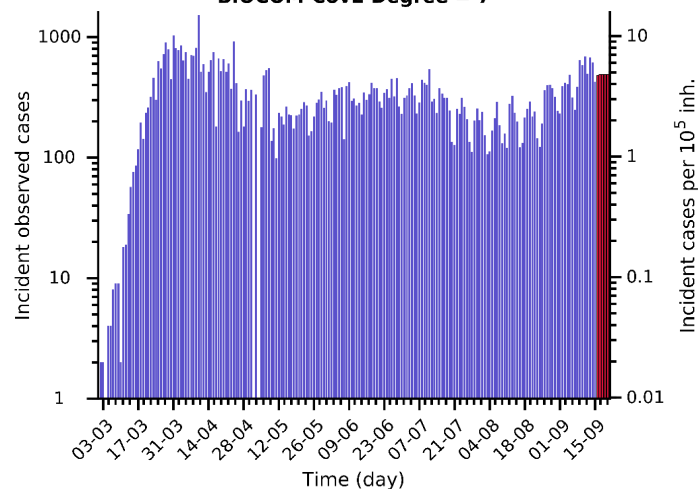
Day	Number of cases	95% Confidence Interval
16-09-2020	65502 (+481)	[ 65021 - 66877 ]
18-09-2020	66479 (+488)	[ 65049 - 67908 ]
20-09-2020	67456 (+489)	[ 65909 - 69003 ]

Current indicators

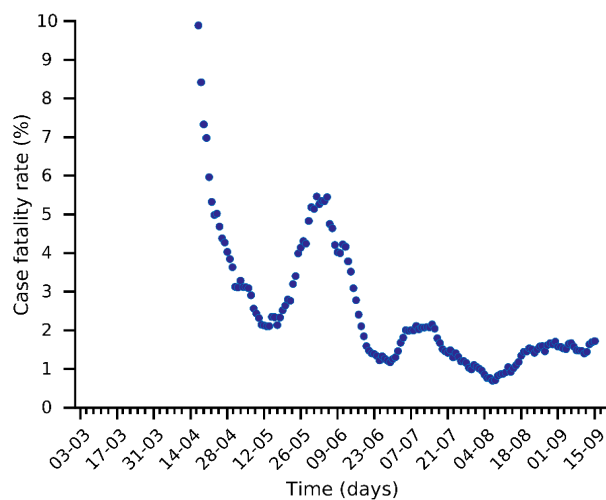
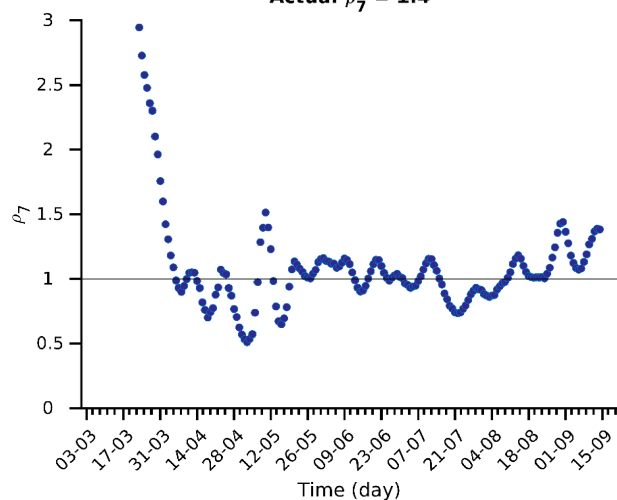
A <sub>14</sub>	EPG	CFR
66	92	1.72 %



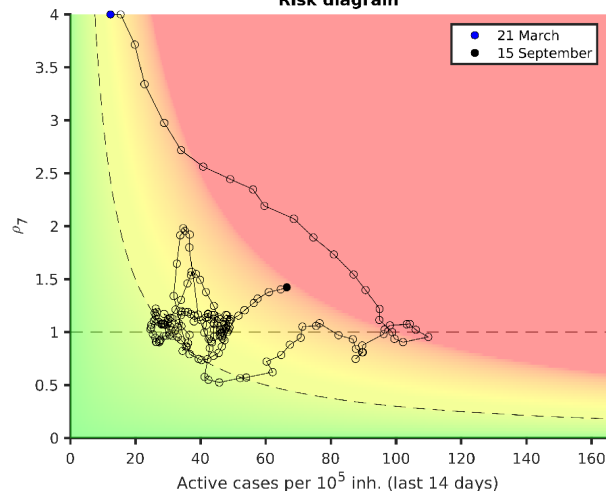
BIOCOM-Cov2 Degree = 7



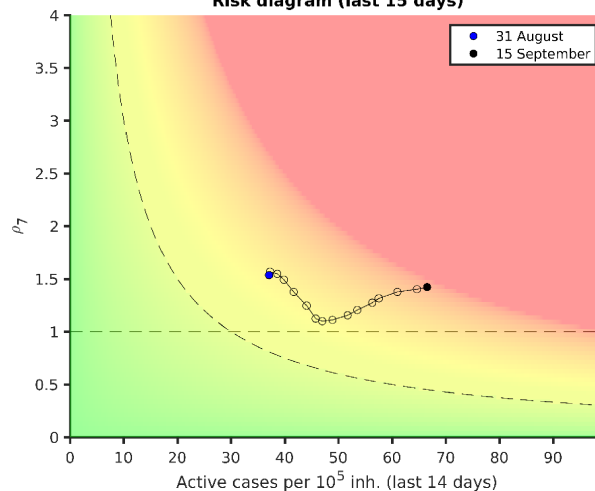
Actual  $\rho_7 = 1.4$



Risk diagram

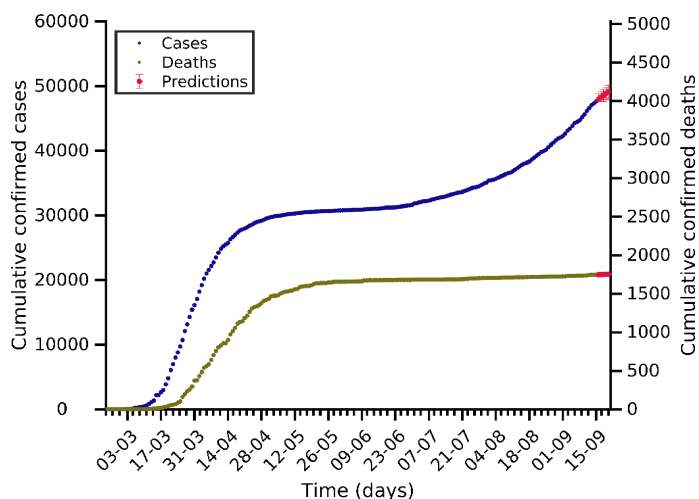


Risk diagram (last 15 days)





# Switzerland 15-09-2020. Pop: 8.7M. Cumulative incidence: 550/10<sup>5</sup>

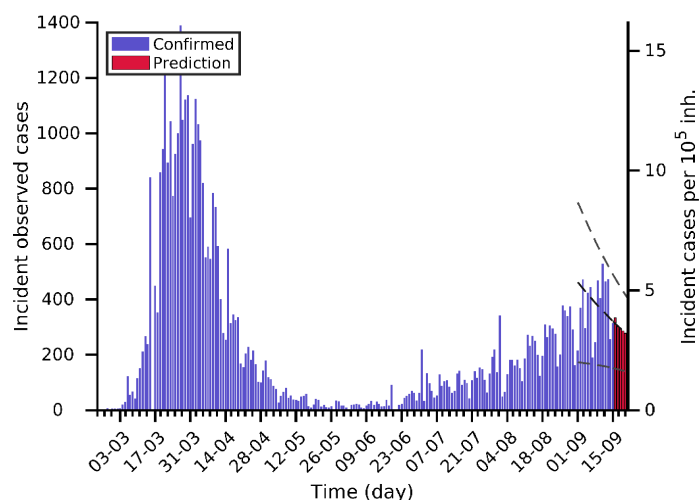


Predictions for next days

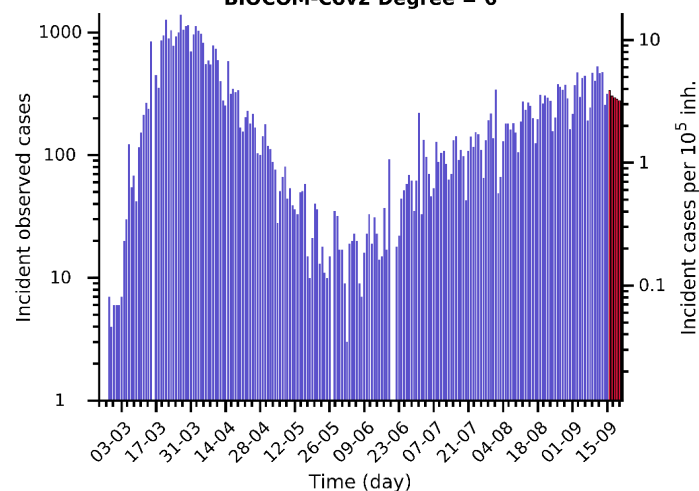
Day	Number of cases	95% Confidence Interval
16-09-2020	47974 (+334)	[ 47640 - 48894 ]
18-09-2020	48573 (+295)	[ 47640 - 49522 ]
20-09-2020	49138 (+278)	[ 48131 - 50144 ]

Current indicators

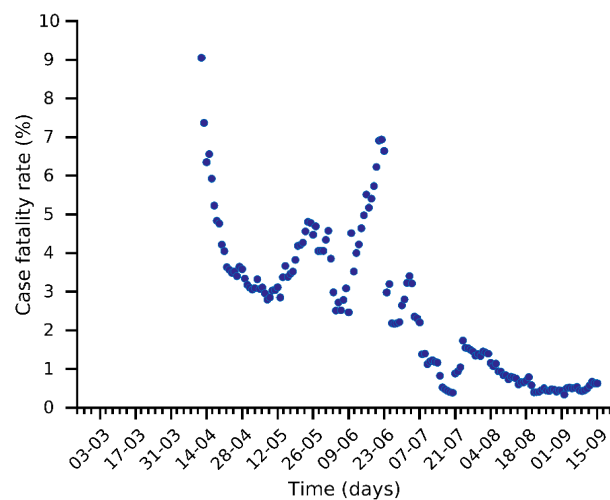
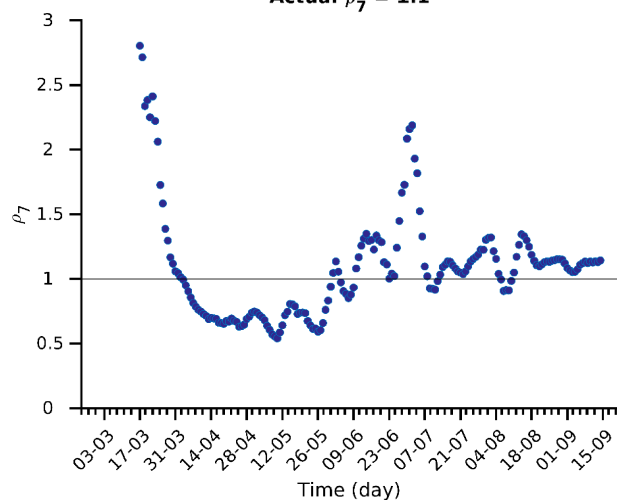
A <sub>14</sub>	EPG	CFR
62	71	0.63 %



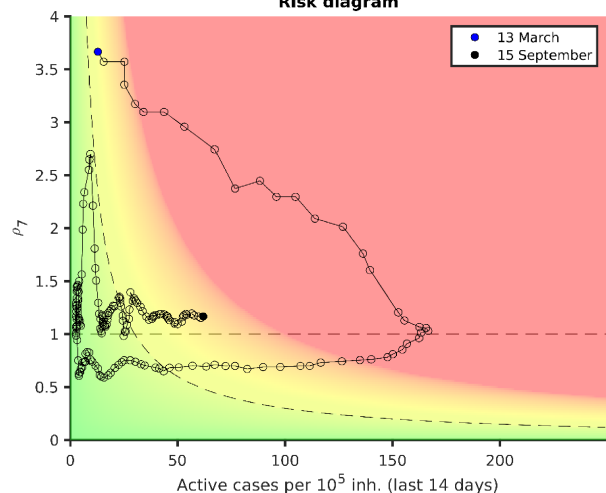
BIOCOM-Cov2 Degree = 6



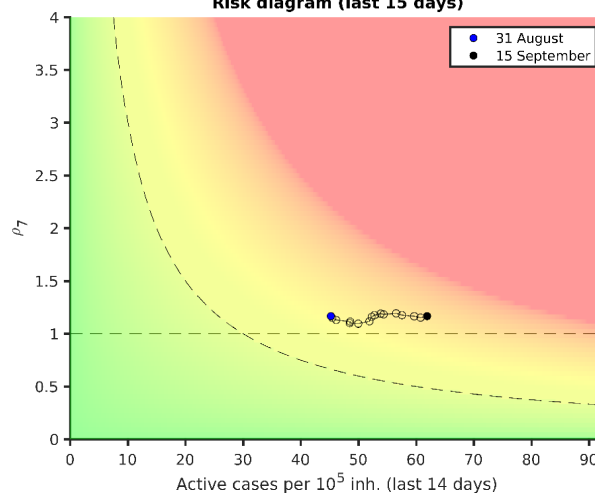
Actual  $\rho_7 = 1.1$



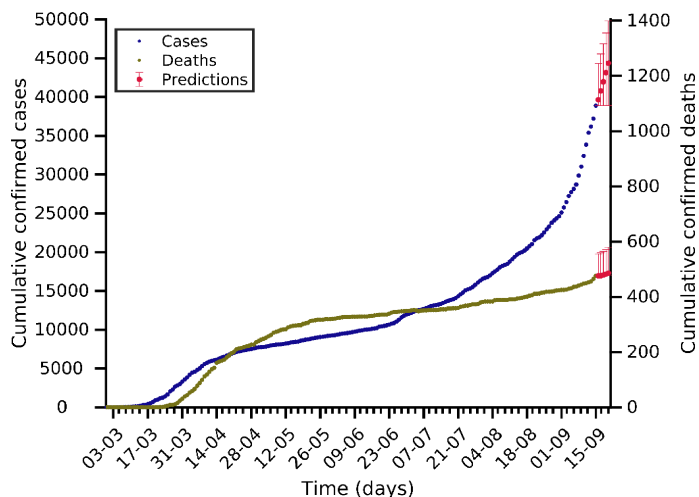
Risk diagram



Risk diagram (last 15 days)



# Czech Rep 15-09-2020. Pop: 10.7M. Cumulative incidence: 363/10<sup>5</sup>

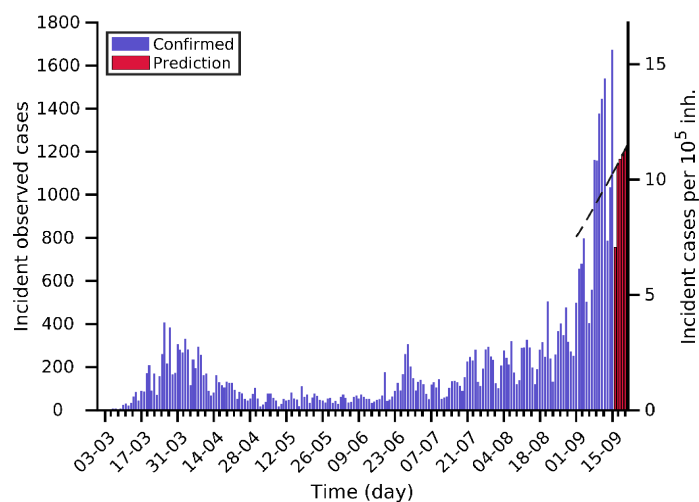


Predictions for next days

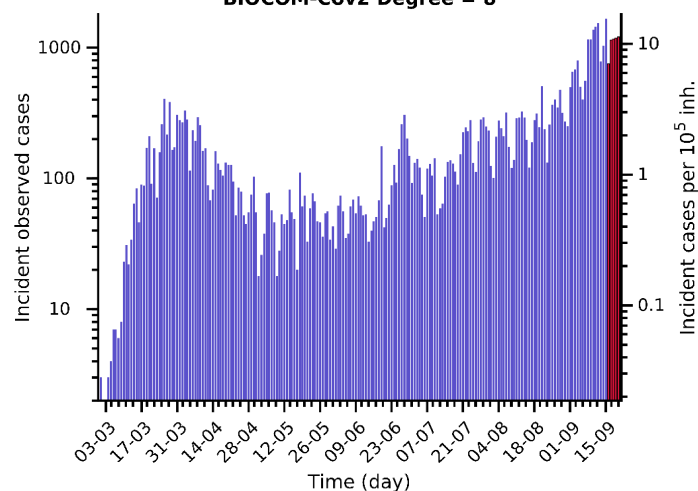
Day	Number of cases	95% Confidence Interval
16-09-2020	39652 (+756)	[ 38896 - 44315 ]
18-09-2020	41961 (+1166)	[ 38896 - 46857 ]
20-09-2020	44363 (+1213)	[ 38924 - 49803 ]

Current indicators

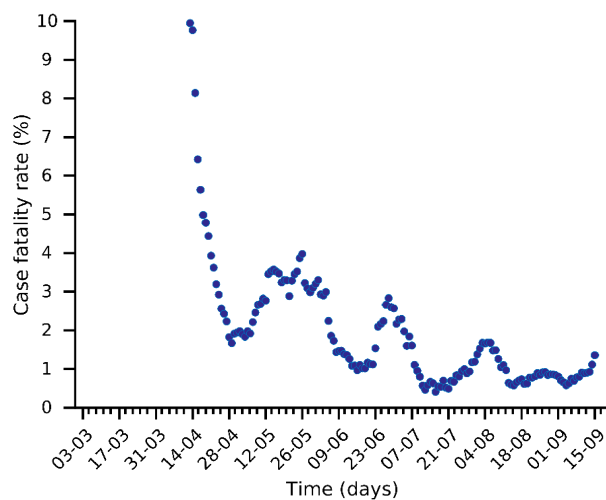
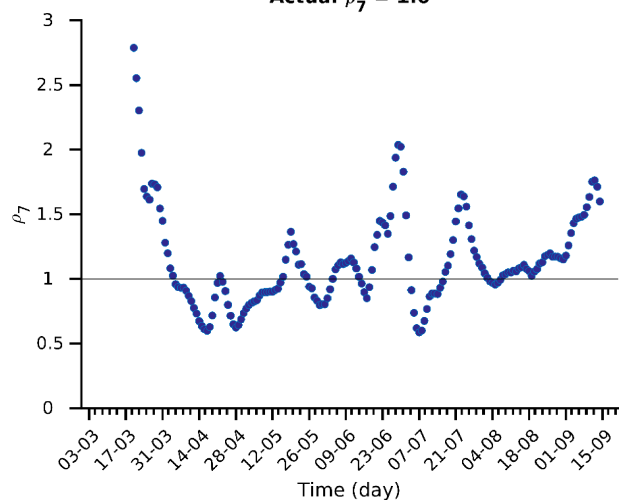
A <sub>14</sub>	EPG	CFR
129	206	1.35 %



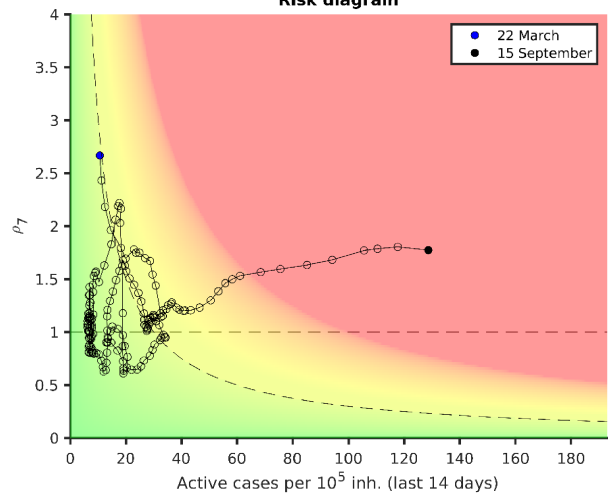
BIOCOM-Cov2 Degree = 8



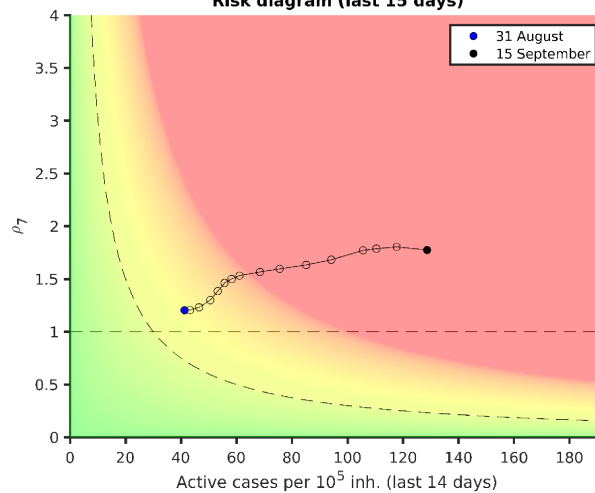
Actual  $\rho_7 = 1.6$



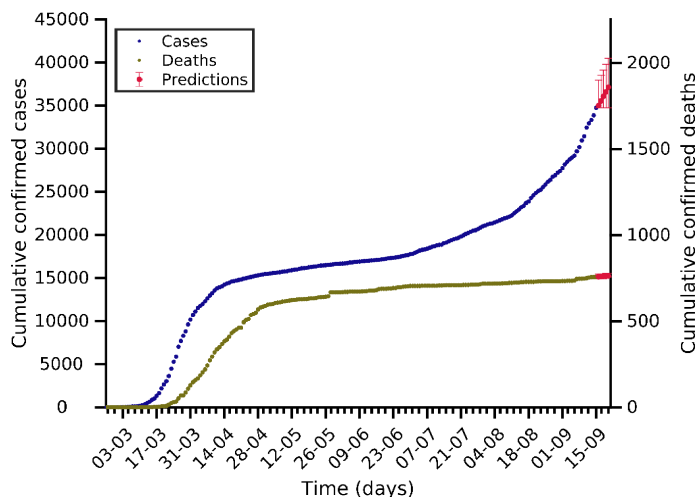
Risk diagram



Risk diagram (last 15 days)



# Austria 15-09-2020. Pop: 9.0M. Cumulative incidence: 386/10<sup>5</sup>

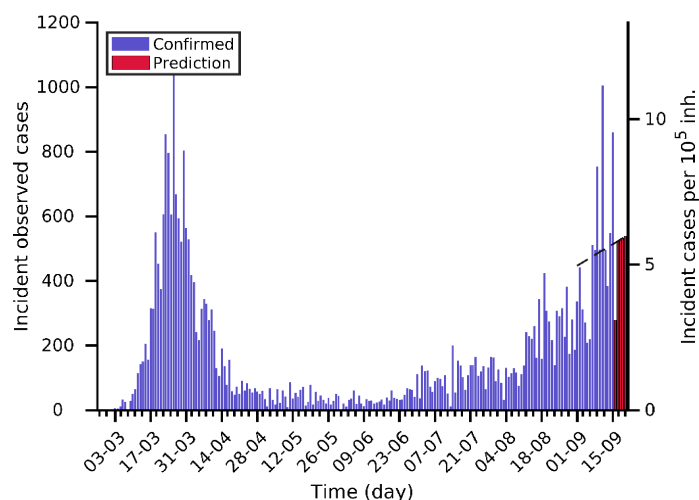


Predictions for next days

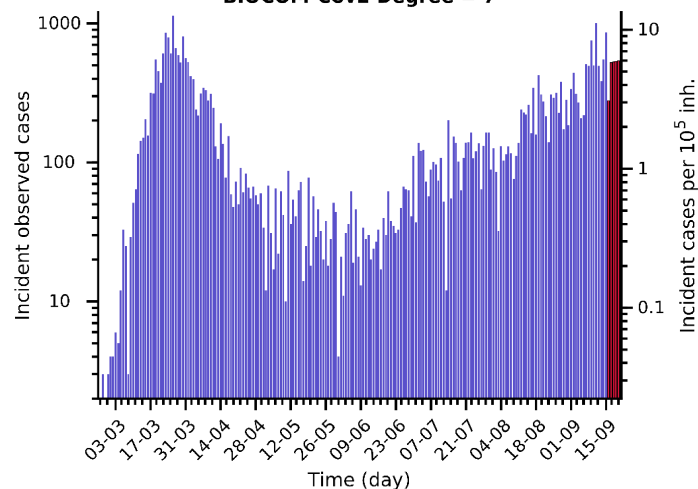
Day	Number of cases	95% Confidence Interval
16-09-2020	35022 (+278)	[ 34744 - 37970 ]
18-09-2020	36074 (+528)	[ 34744 - 39150 ]
20-09-2020	37144 (+538)	[ 34744 - 40508 ]

Current indicators

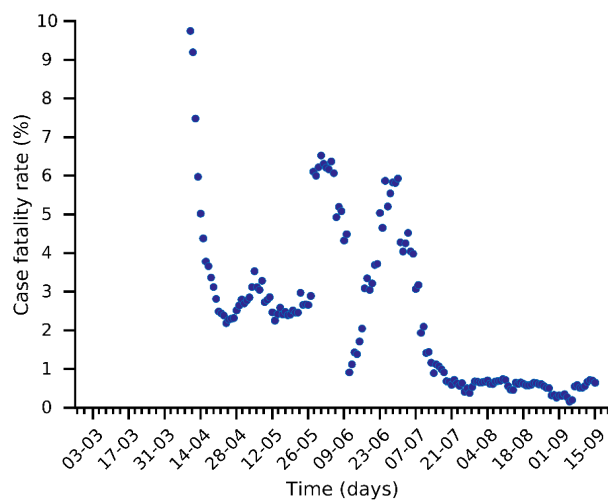
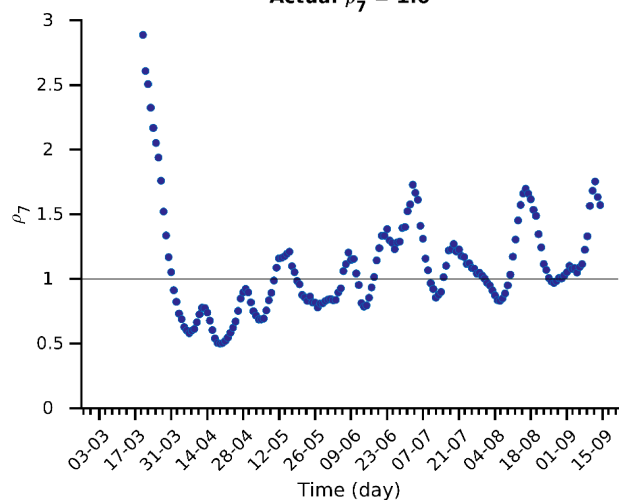
A <sub>14</sub>	EPG	CFR
78	122	0.64 %



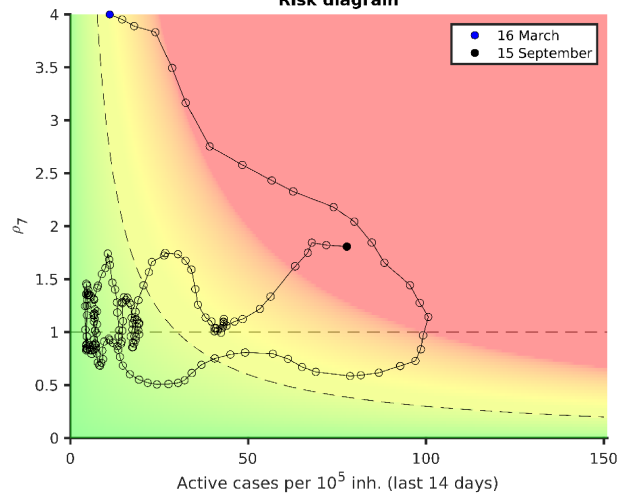
BIOCOM-Cov2 Degree = 7



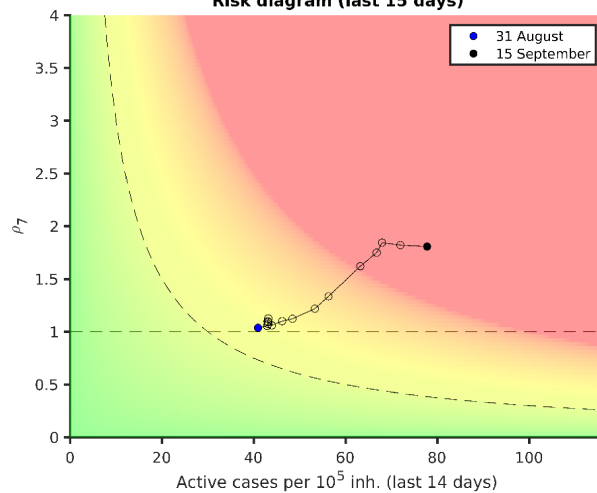
Actual  $\rho_7 = 1.6$



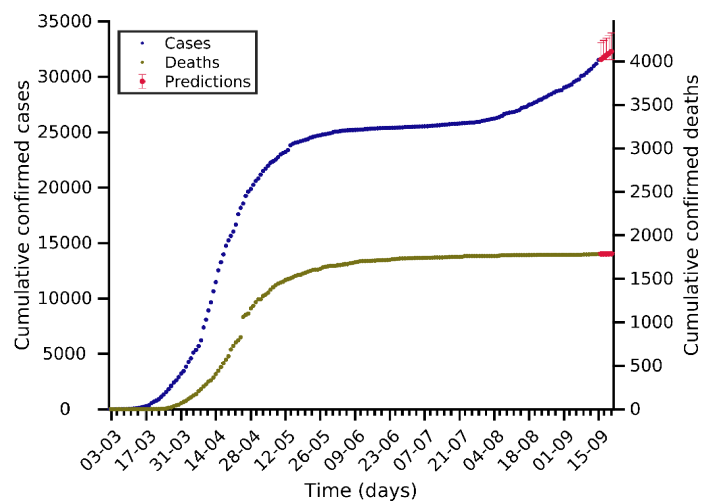
Risk diagram



Risk diagram (last 15 days)



# Ireland 15-09-2020. Pop: 4.9M. Cumulative incidence: 639/10<sup>5</sup>

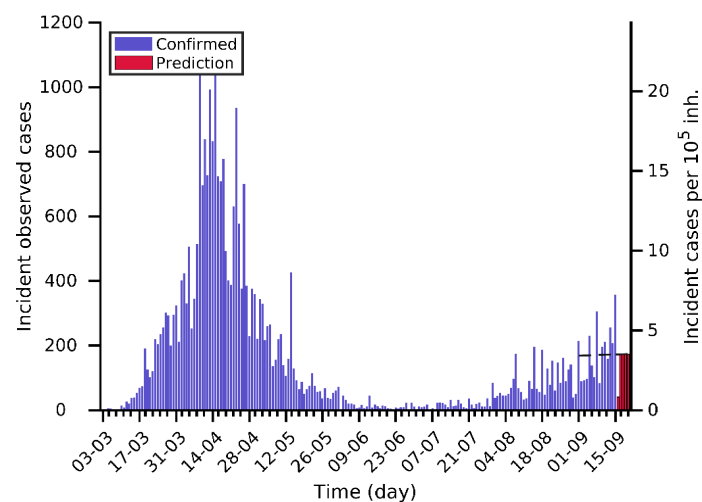


Predictions for next days

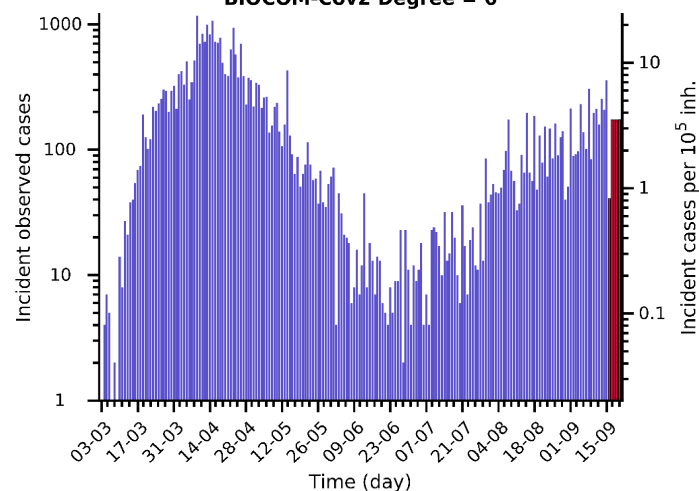
Day	Number of cases	95% Confidence Interval
16-09-2020	31590 (+41)	[ 31549 - 33092 ]
18-09-2020	31937 (+173)	[ 31549 - 33498 ]
20-09-2020	32284 (+174)	[ 31549 - 33974 ]

Current indicators

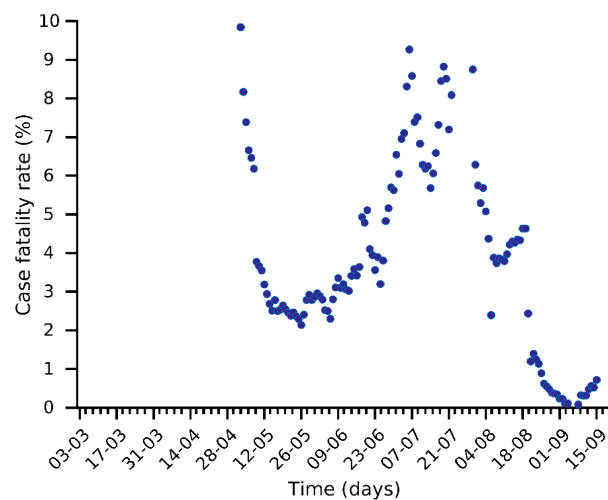
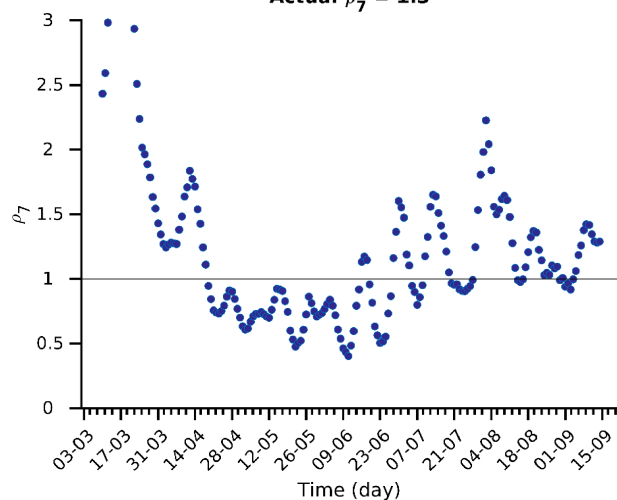
A <sub>14</sub>	EPG	CFR
51	66	0.71 %



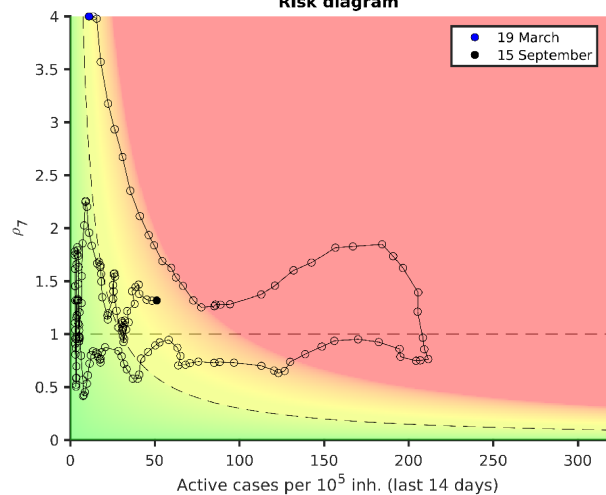
BIOCOM-Cov2 Degree = 6



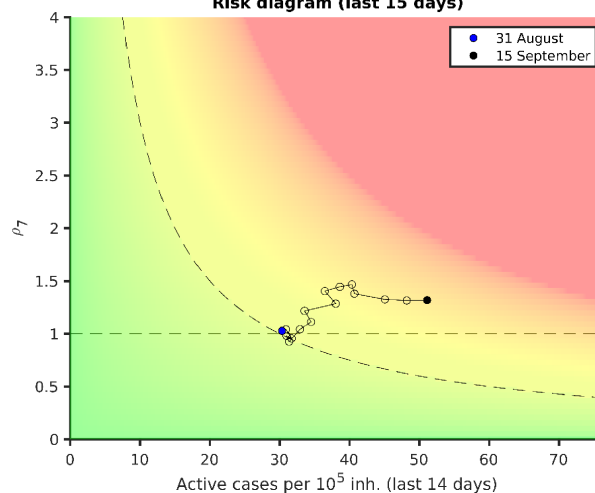
Actual  $\rho_7 = 1.3$



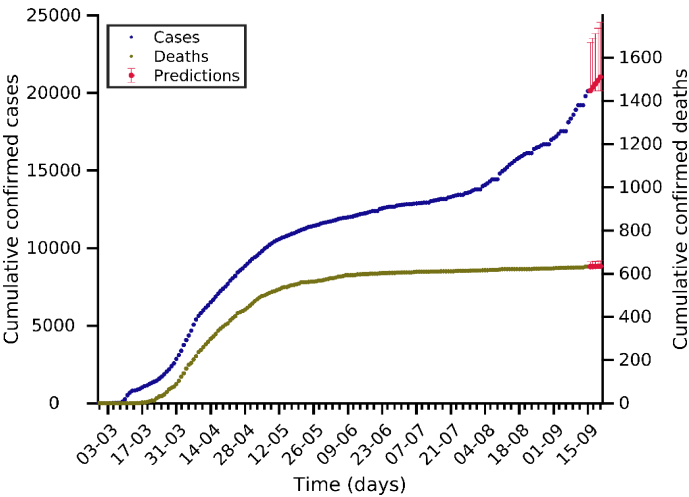
Risk diagram



Risk diagram (last 15 days)

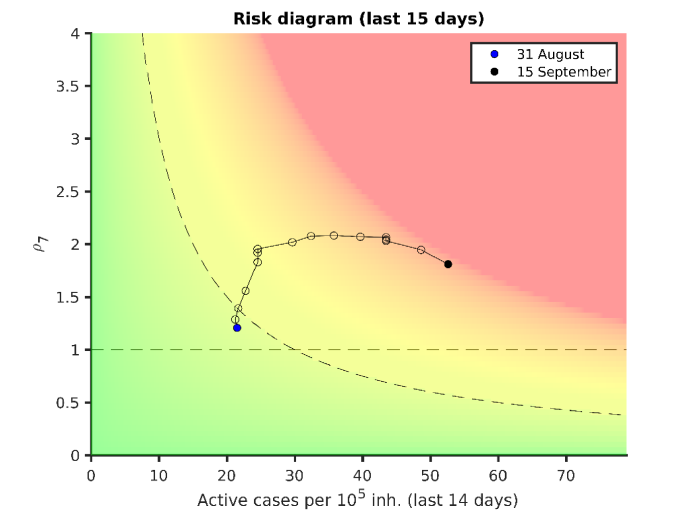
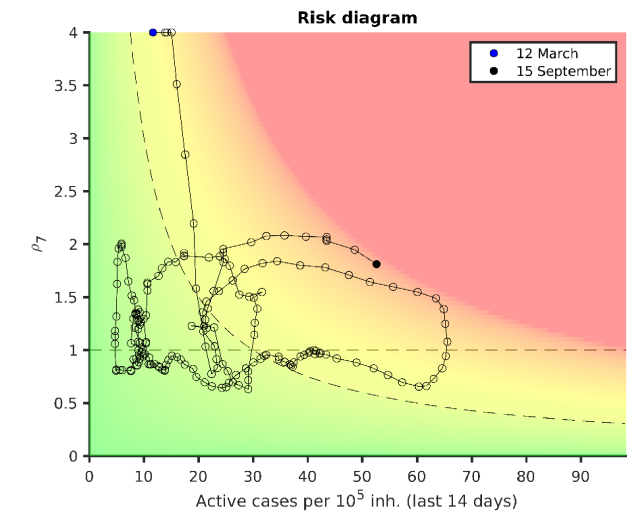
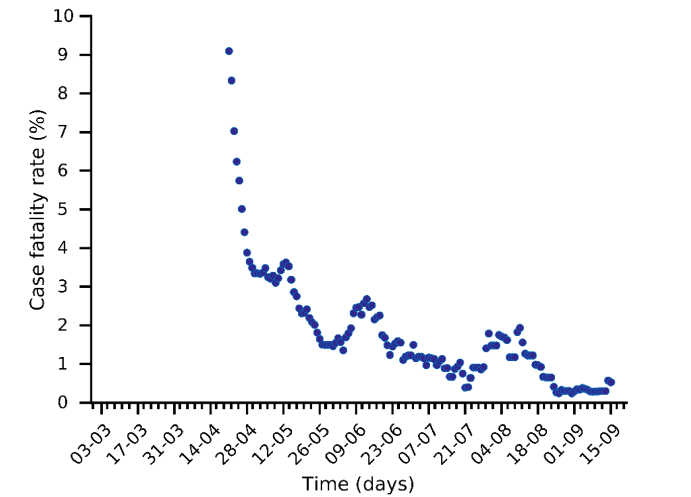
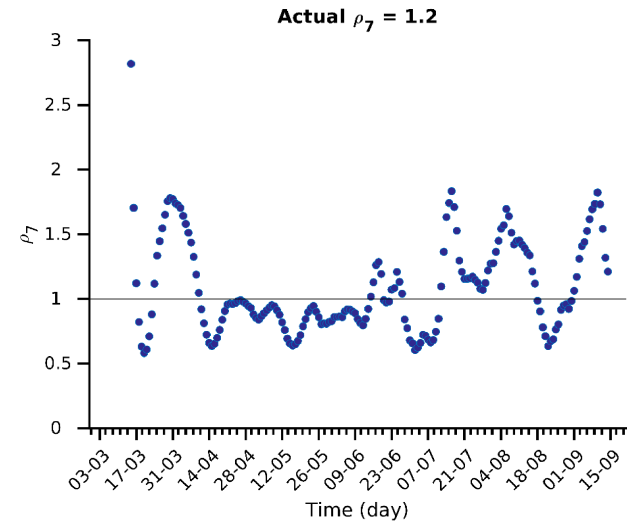
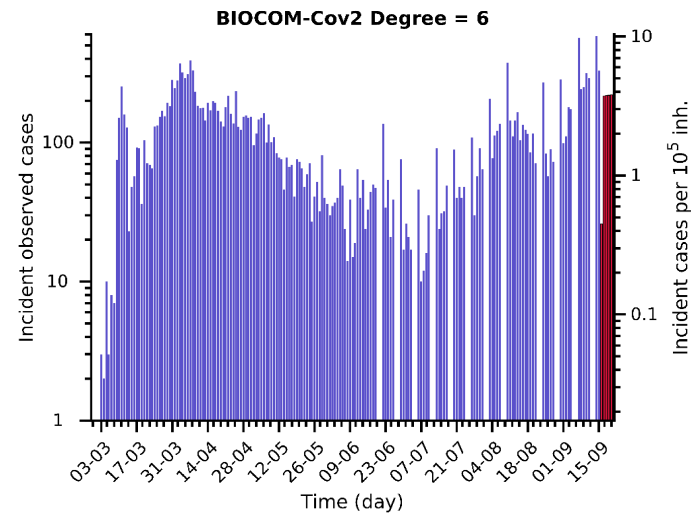
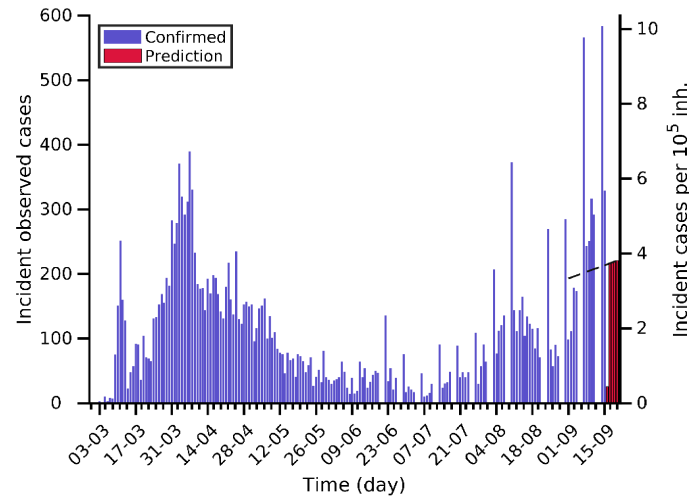


Denmark 15-09-2020. Pop: 5.8M. Cumulative incidence: 348/10<sup>5</sup>

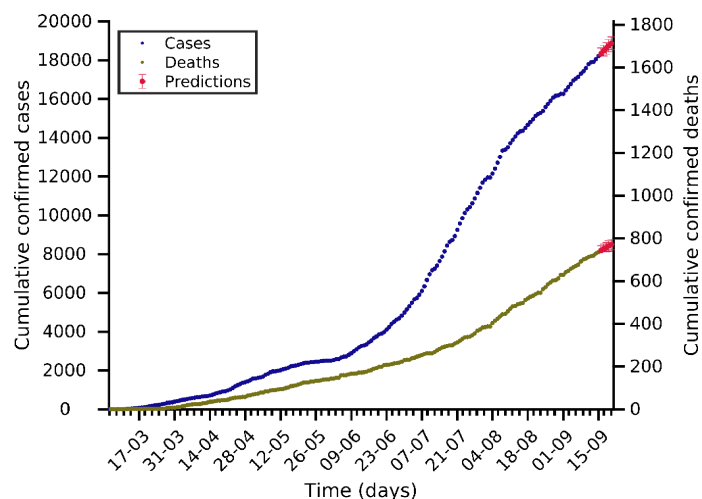


Predictions for next days		
Day	Number of cases	95% Confidence Interval
16-09-2020	20155 (+26)	[ 20129 - 23261 ]
18-09-2020	20589 (+218)	[ 20129 - 23827 ]
20-09-2020	21029 (+221)	[ 20129 - 24556 ]

Current indicators		
A <sub>14</sub>	EPG	CFR
53	64	0.53 %



# Bulgaria 15-09-2020. Pop: 6.9M. Cumulative incidence: 262/10<sup>5</sup>

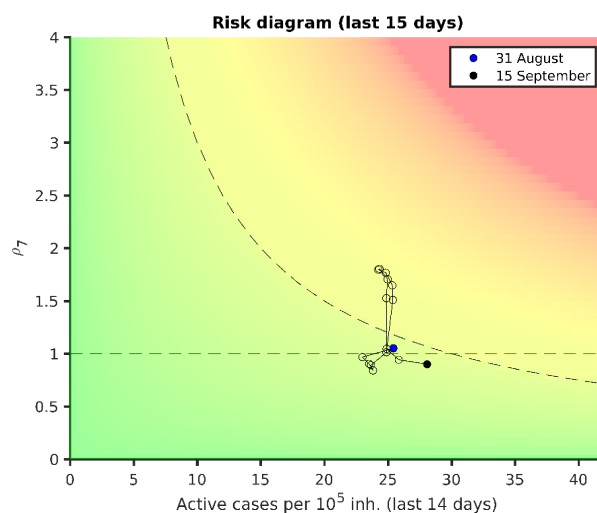
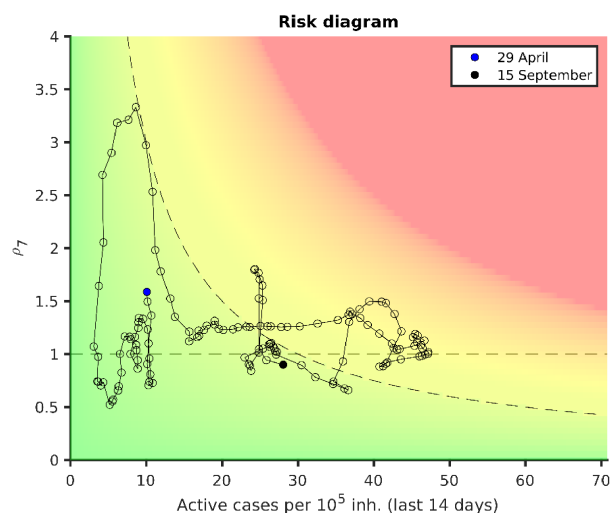
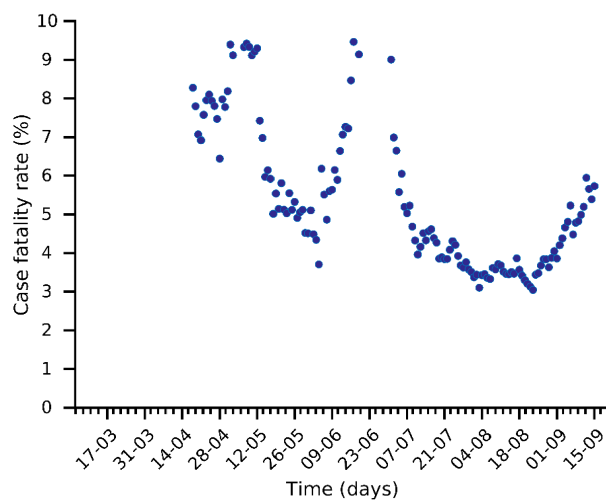
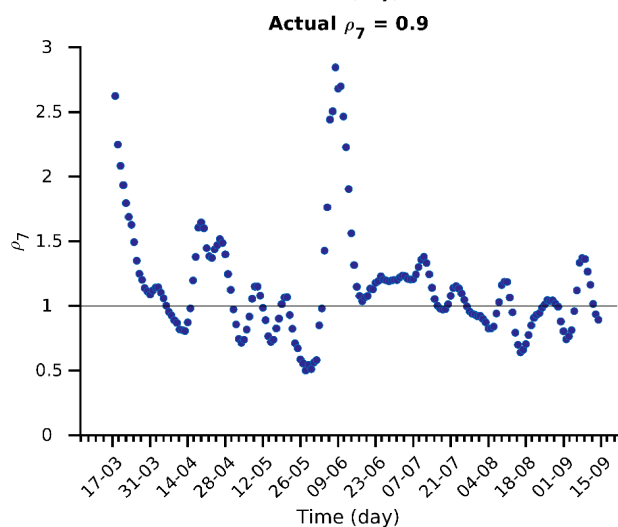
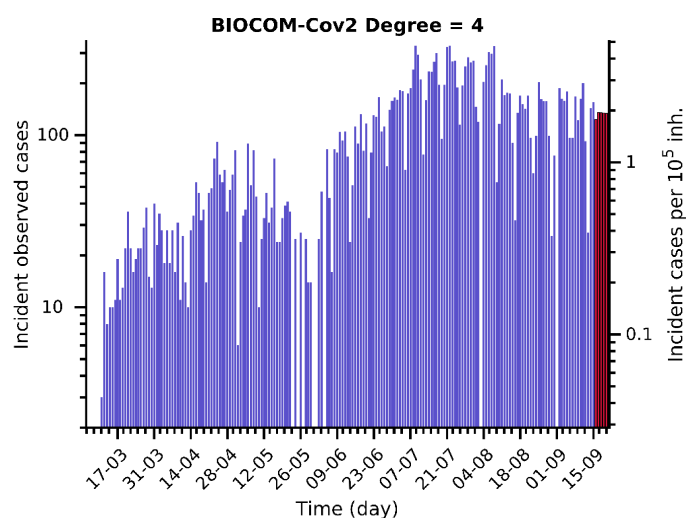
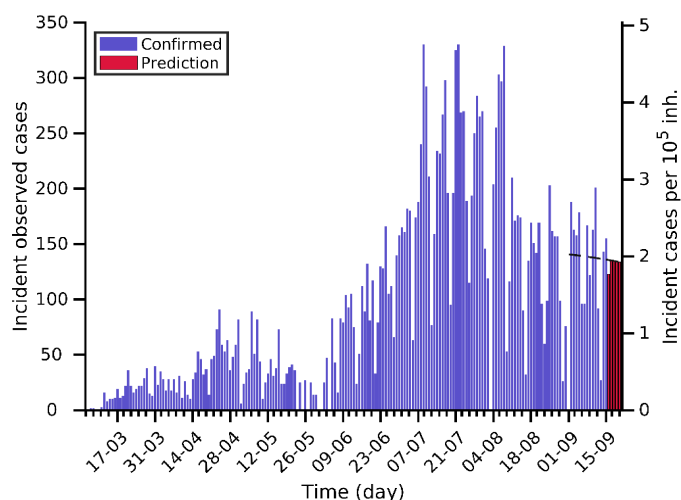


Predictions for next days

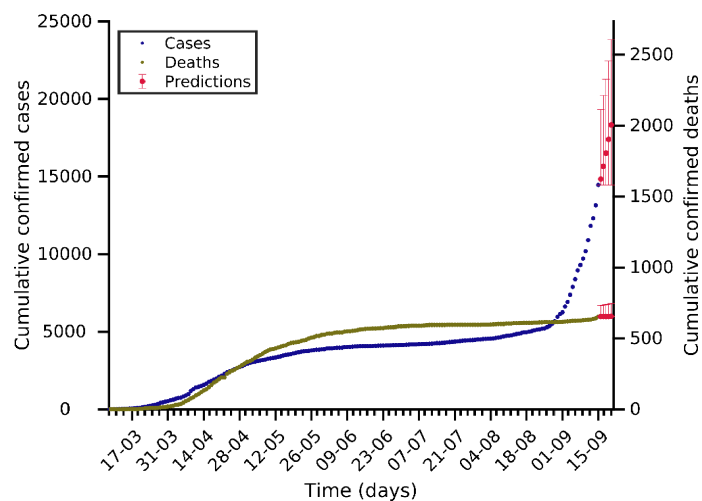
Day	Number of cases	95% Confidence Interval
16-09-2020	18339 (+123)	[ 18216 - 18632 ]
18-09-2020	18609 (+135)	[ 18304 - 18913 ]
20-09-2020	18877 (+134)	[ 18548 - 19206 ]

Current indicators

A <sub>14</sub>	EPG	CFR
28	25	5.73 %



# Hungary 15-09-2020. Pop: 9.7M. Cumulative incidence: 150/10<sup>5</sup>

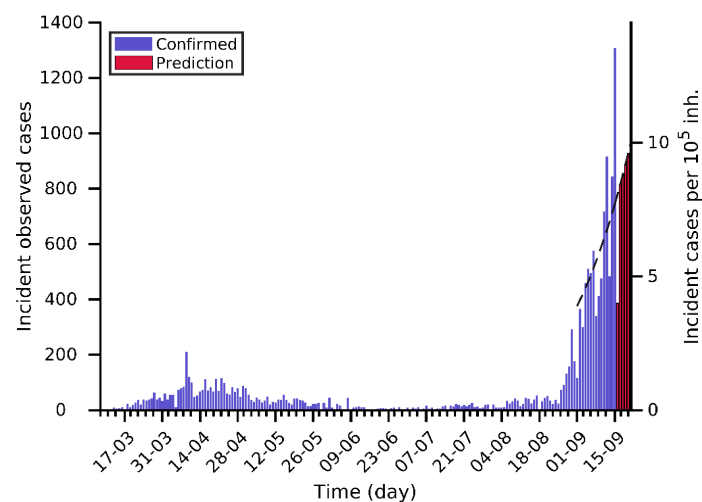


Predictions for next days

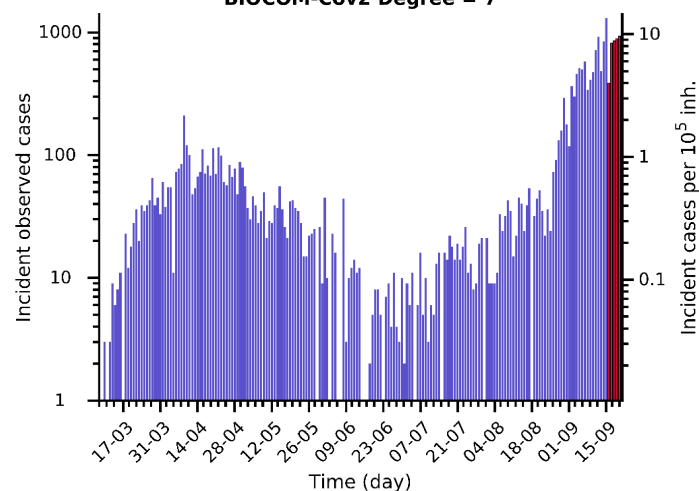
Day	Number of cases	95% Confidence Interval
16-09-2020	14846 (+386)	[ 14460 - 19320 ]
18-09-2020	16513 (+852)	[ 14460 - 21275 ]
20-09-2020	18332 (+929)	[ 14460 - 23833 ]

Current indicators

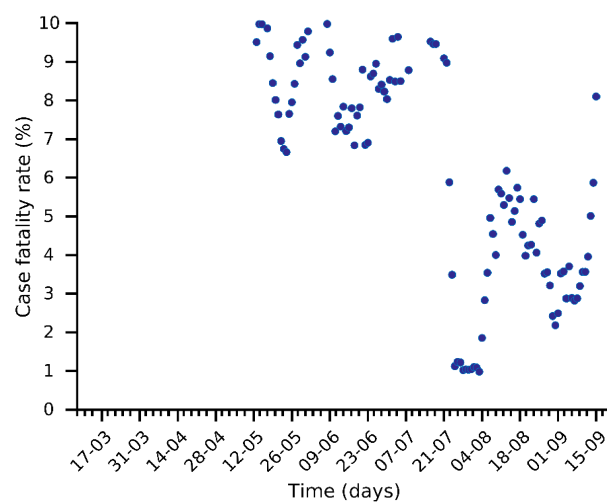
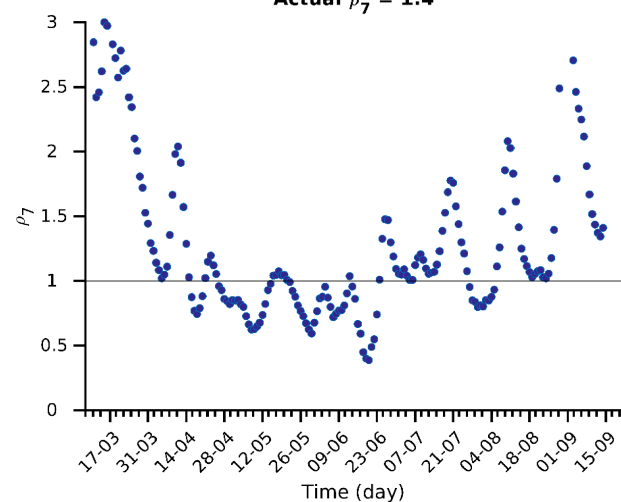
A <sub>14</sub>	EPG	CFR
85	120	8.10 %



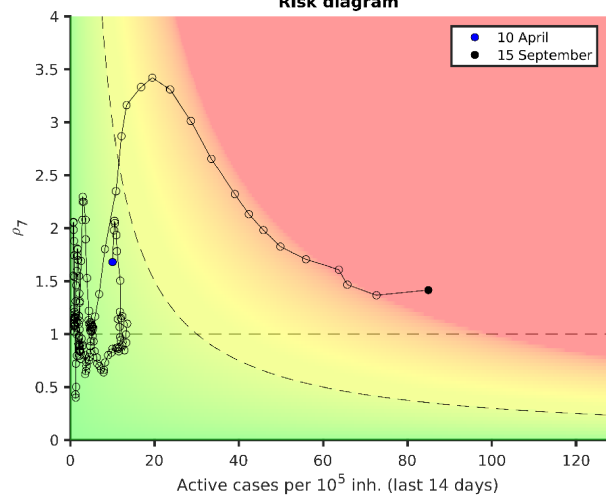
BIOCOM-Cov2 Degree = 7



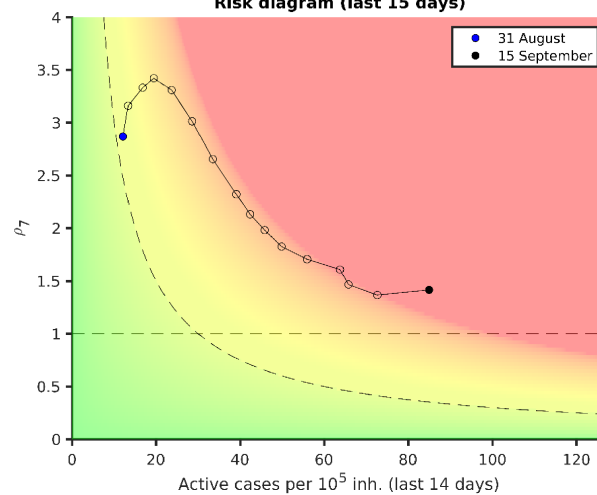
Actual  $\rho_7 = 1.4$



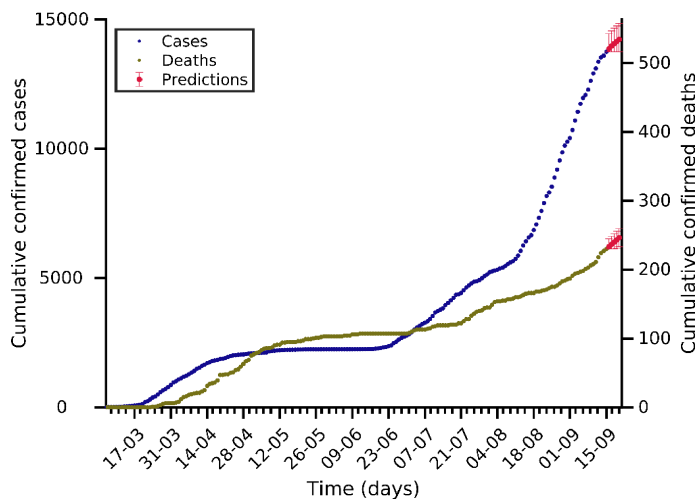
Risk diagram



Risk diagram (last 15 days)



# Croatia 15-09-2020. Pop: 4.1M. Cumulative incidence: 335/10<sup>5</sup>

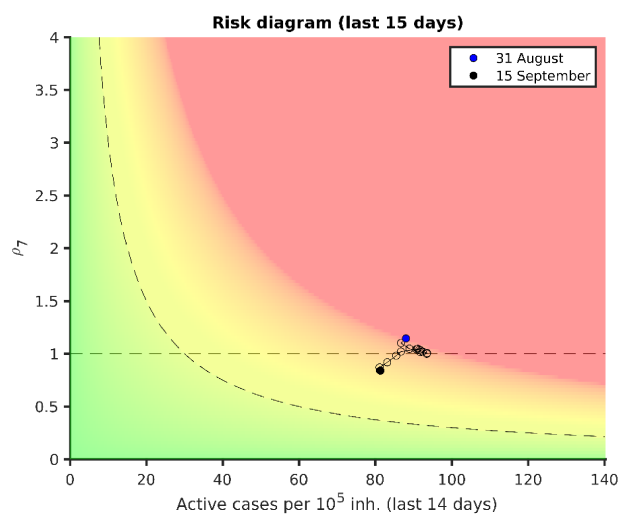
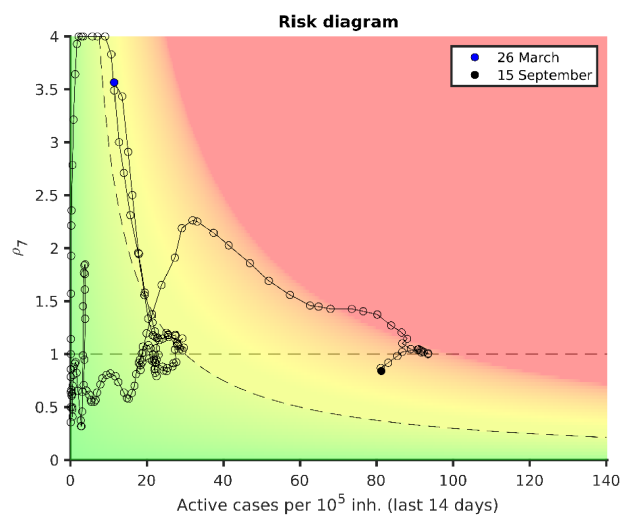
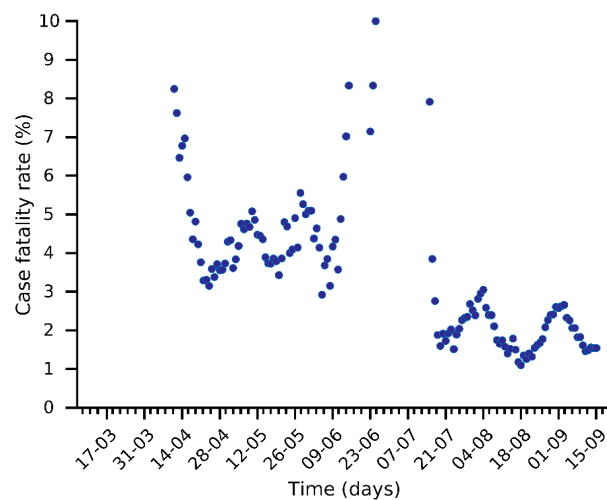
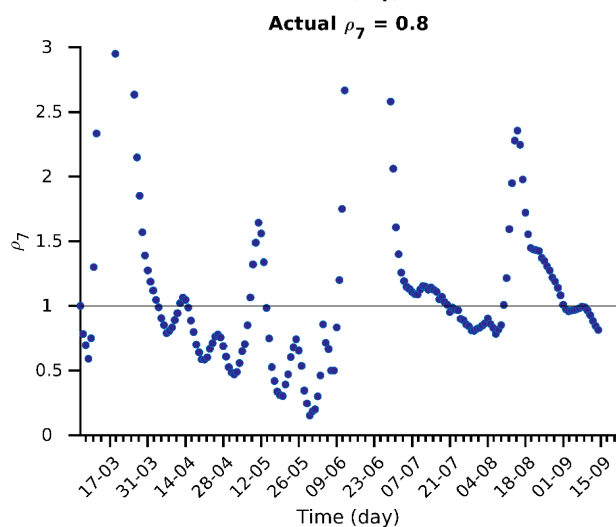
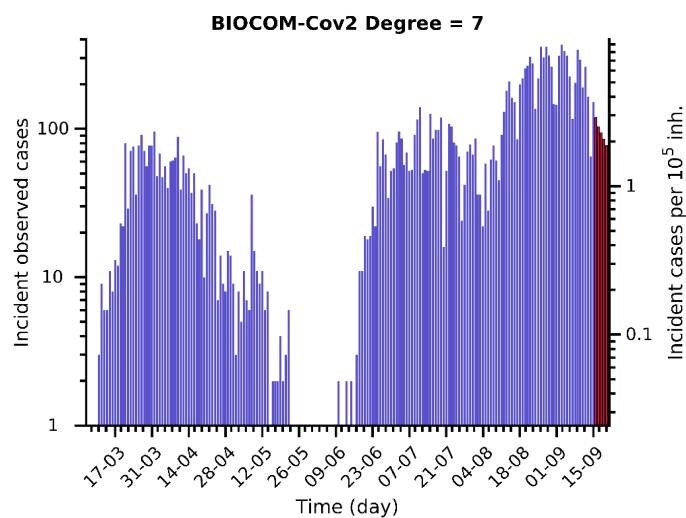
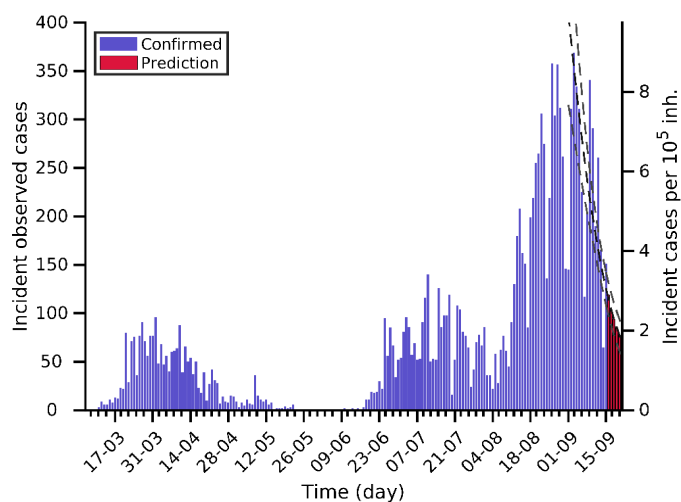


Predictions for next days

Day	Number of cases	95% Confidence Interval
16-09-2020	13868 (+119)	[ 13749 - 14454 ]
18-09-2020	14065 (+94)	[ 13749 - 14662 ]
20-09-2020	14227 (+77)	[ 13749 - 14841 ]

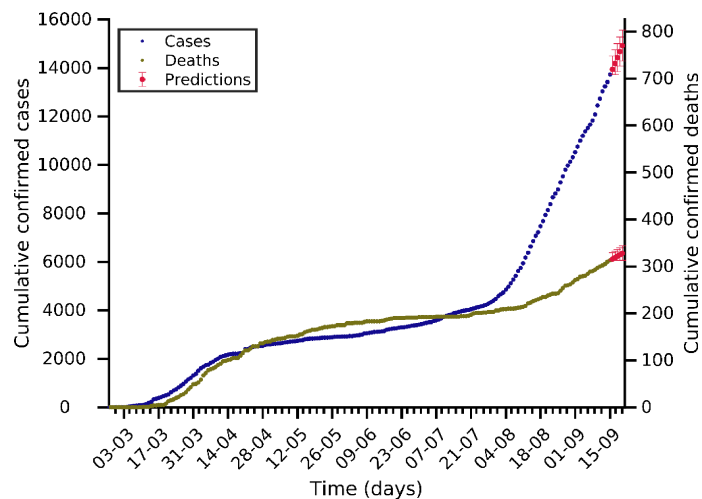
Current indicators

A <sub>14</sub>	EPG	CFR
81	66	1.54 %





# Greece 15-09-2020. Pop: 10.4M. Cumulative incidence: 132/10<sup>5</sup>

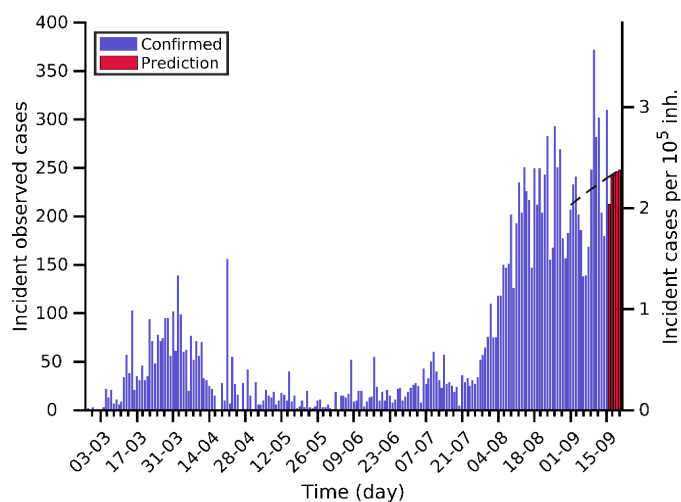


Predictions for next days

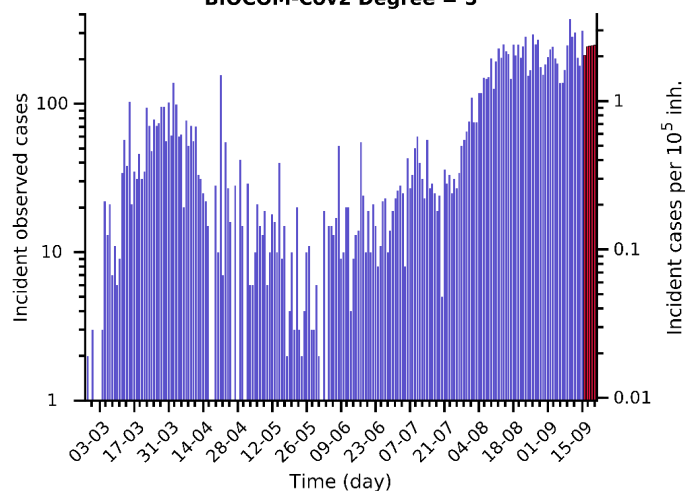
Day	Number of cases	95% Confidence Interval
16-09-2020	13942 (+212)	[ 13730 - 14498 ]
18-09-2020	14430 (+245)	[ 13850 - 15009 ]
20-09-2020	14924 (+248)	[ 14290 - 15557 ]

Current indicators

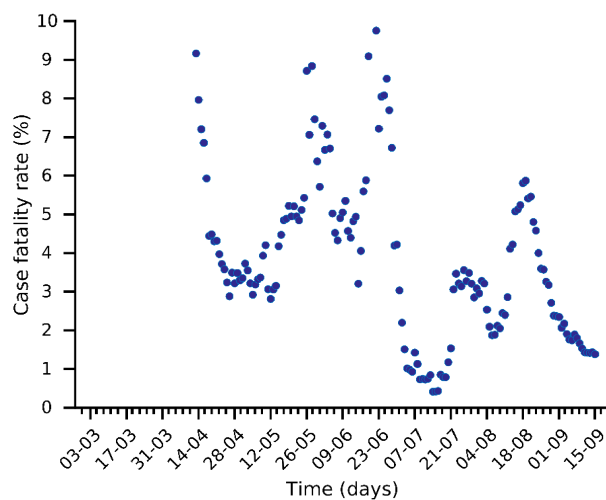
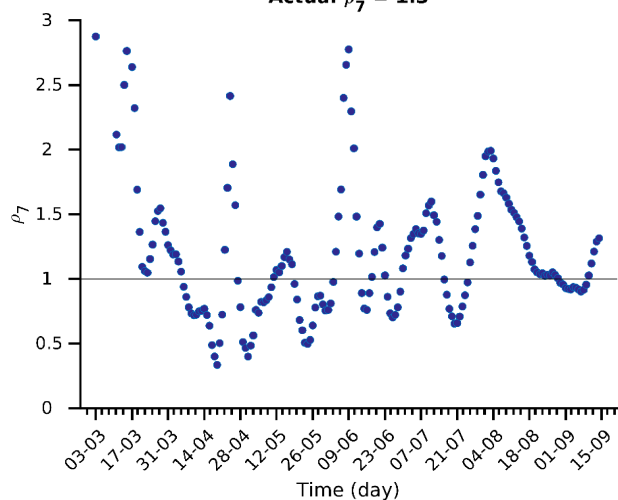
A <sub>14</sub>	EPG	CFR
31	40	1.38 %



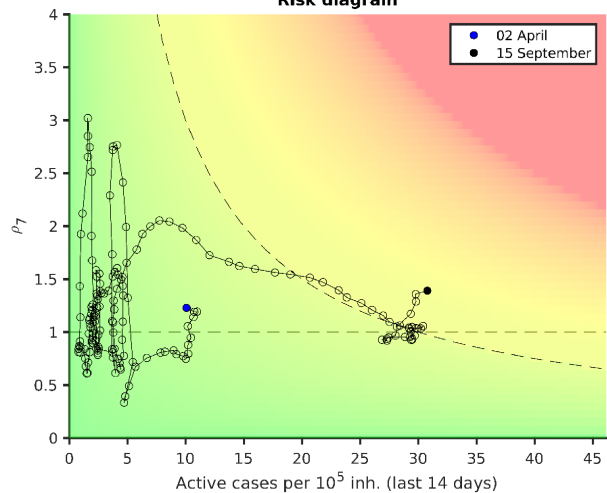
BIOCOM-Cov2 Degree = 5



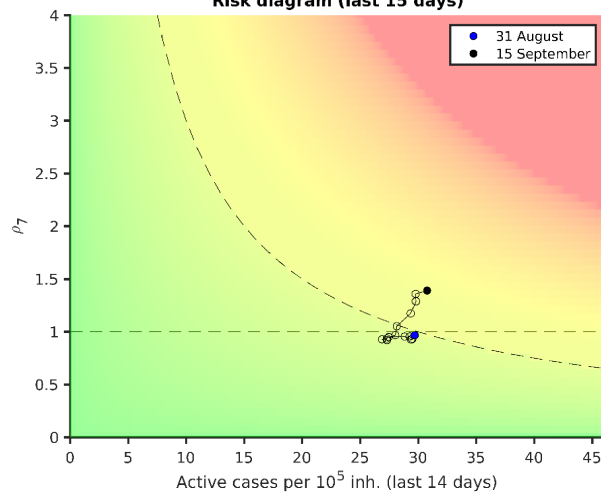
Actual  $\rho_7 = 1.3$



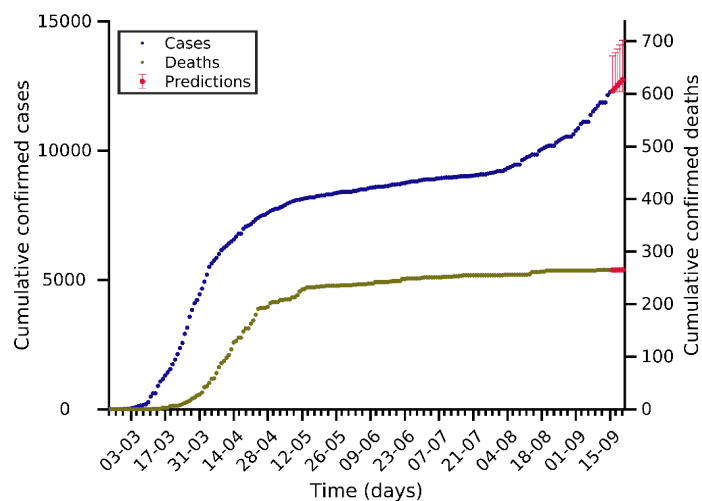
Risk diagram



Risk diagram (last 15 days)



# Norway 15-09-2020. Pop: 5.4M. Cumulative incidence: 226/10<sup>5</sup>

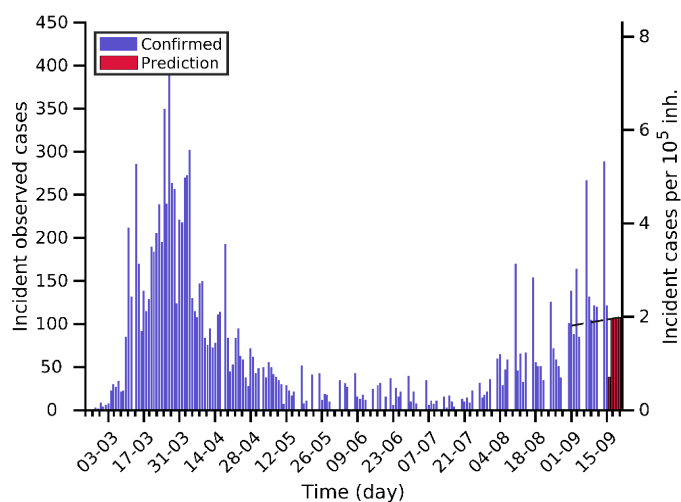


Predictions for next days

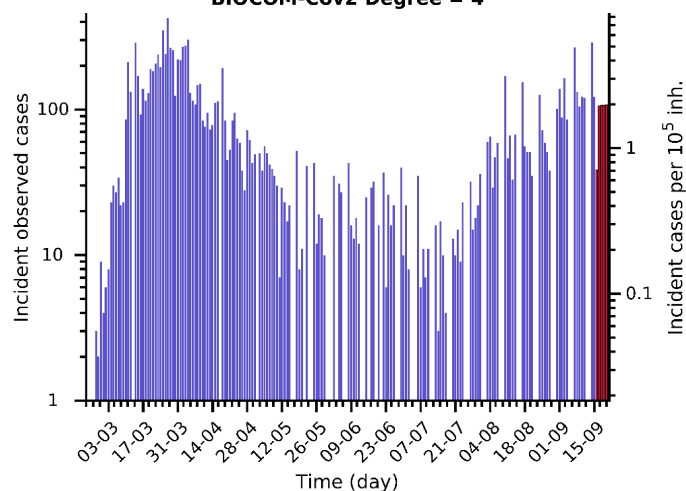
Day	Number of cases	95% Confidence Interval
16-09-2020	12316 (+39)	[ 12277 - 13664 ]
18-09-2020	12529 (+107)	[ 12277 - 13932 ]
20-09-2020	12744 (+108)	[ 12277 - 14269 ]

Current indicators

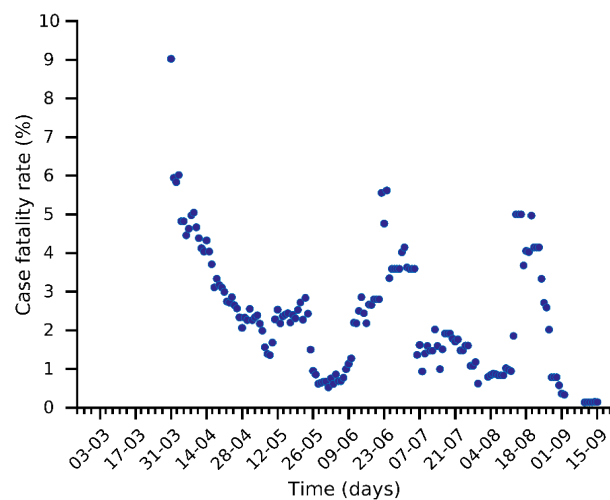
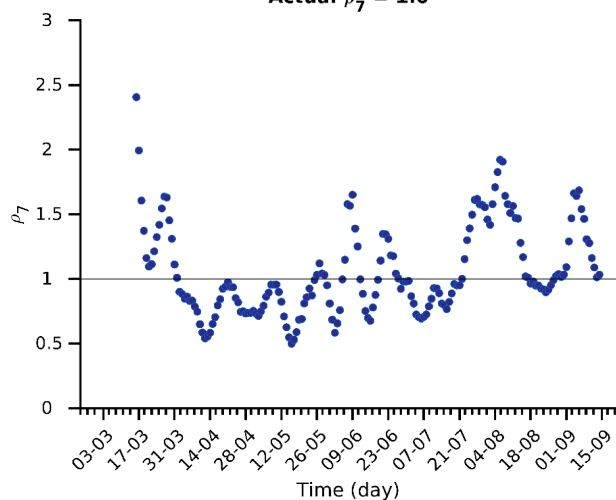
A <sub>14</sub>	EPG	CFR
28	28	0.14 %



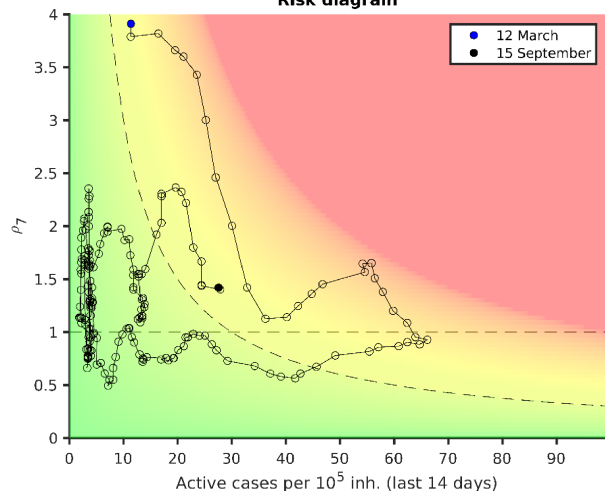
BIOCOM-Cov2 Degree = 4



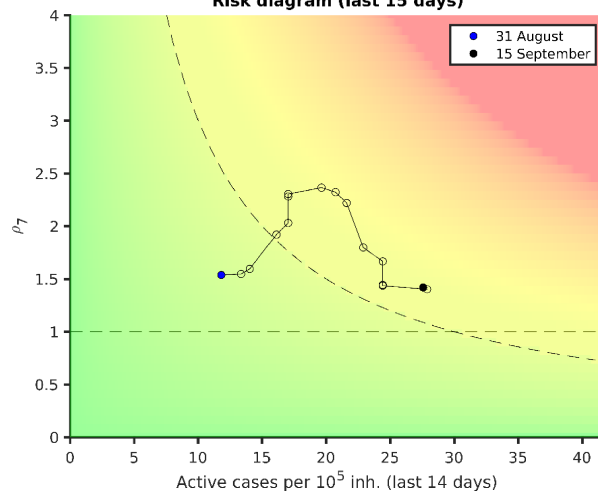
Actual  $\rho_7 = 1.0$



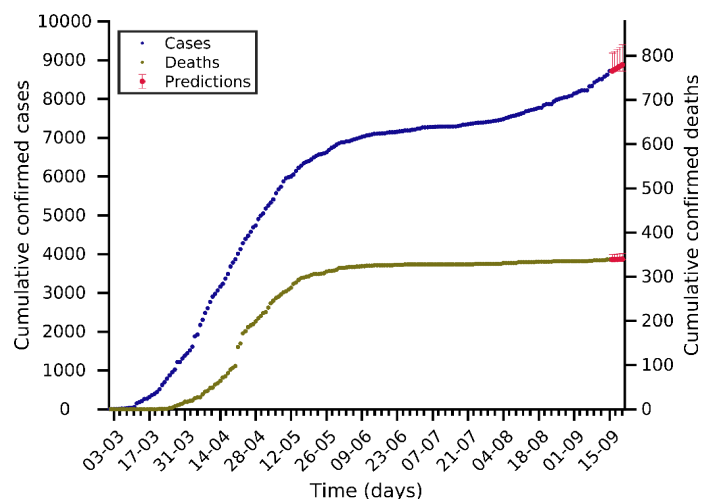
Risk diagram



Risk diagram (last 15 days)



# Finland 15-09-2020. Pop: 5.5M. Cumulative incidence: 157/10<sup>5</sup>

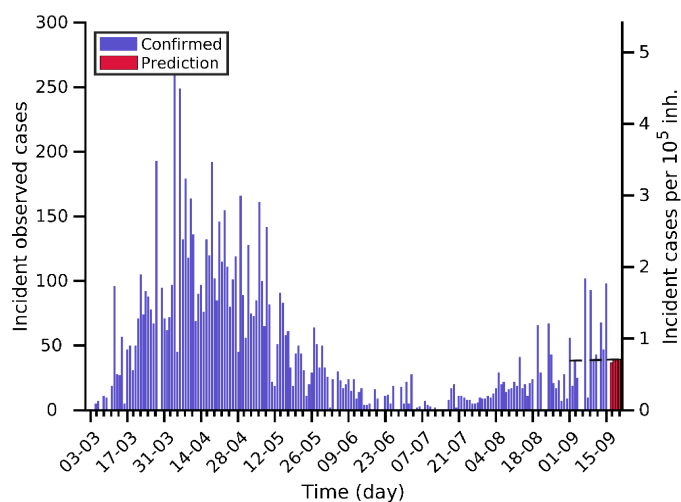


Predictions for next days

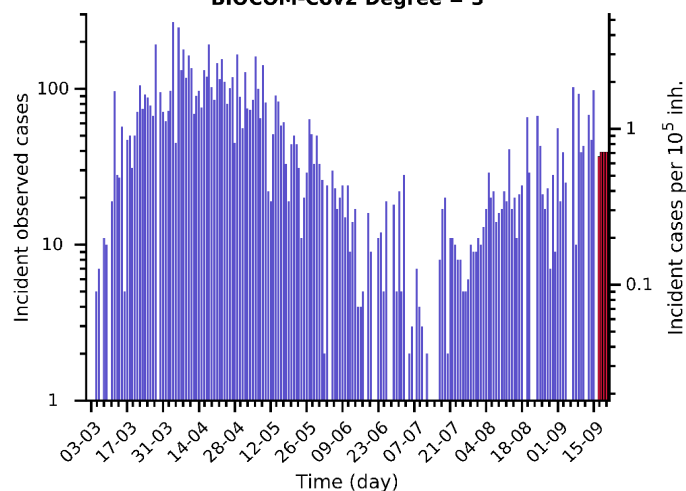
Day	Number of cases	95% Confidence Interval
16-09-2020	8725 (+0)	[ 8725 - 9184 ]
18-09-2020	8801 (+39)	[ 8725 - 9280 ]
20-09-2020	8879 (+39)	[ 8725 - 9398 ]

Current indicators

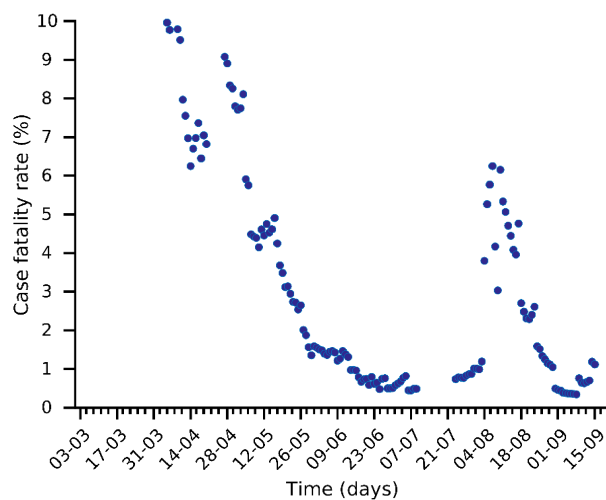
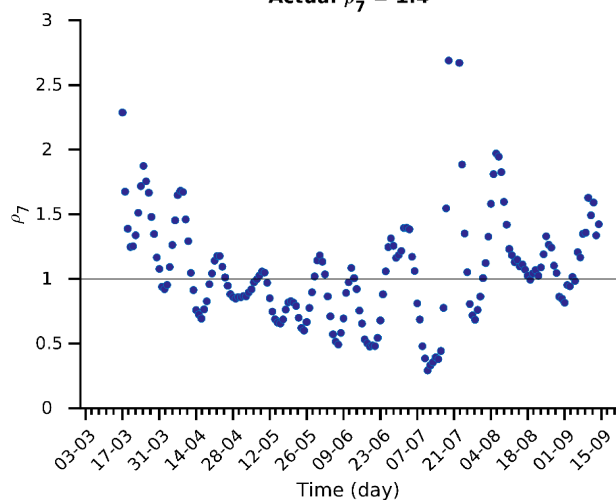
A <sub>14</sub>	EPG	CFR
11	15	1.12 %



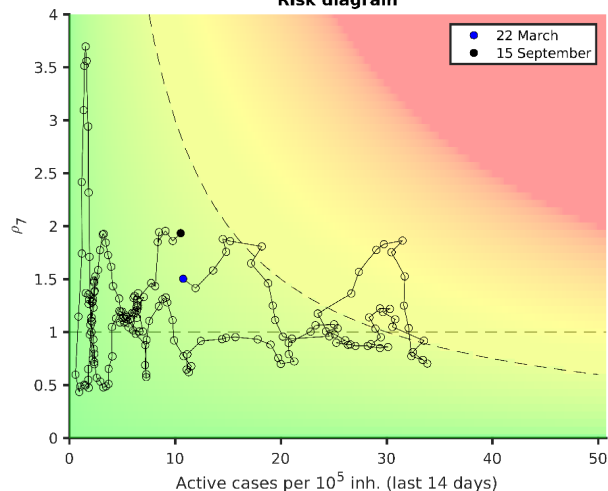
BIOCOM-Cov2 Degree = 3



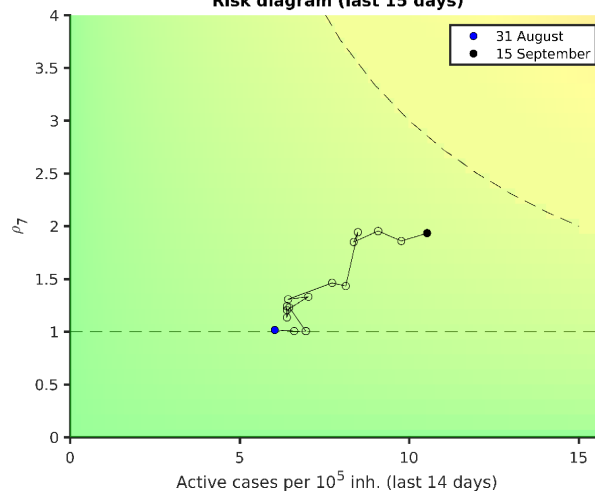
Actual  $\rho_7 = 1.4$



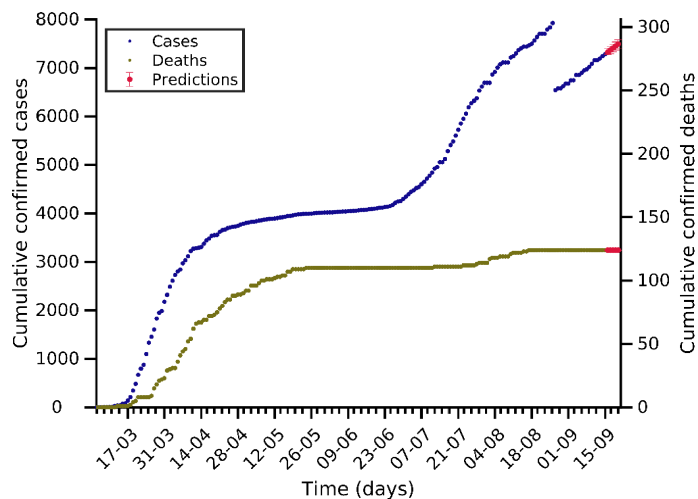
Risk diagram



Risk diagram (last 15 days)



# Luxembourg 15-09-2020. Pop: 0.6M. Cumulative incidence: 1164/10<sup>5</sup>

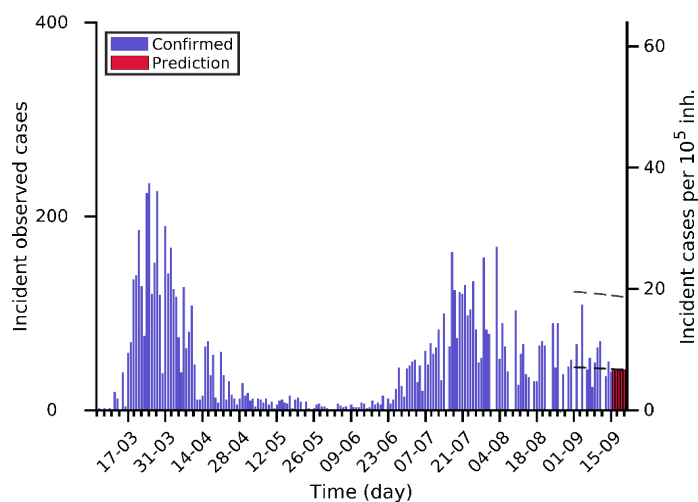


Predictions for next days

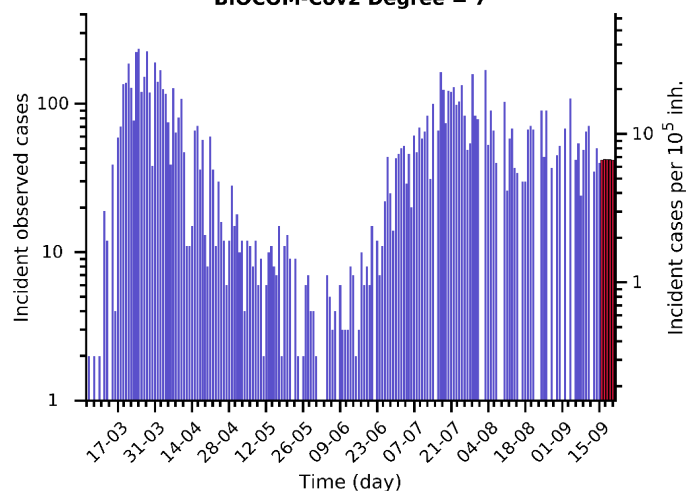
Day	Number of cases	95% Confidence Interval
16-09-2020	7326 (+42)	[ 7284 - 7404 ]
18-09-2020	7410 (+42)	[ 7329 - 7491 ]
20-09-2020	7493 (+42)	[ 7406 - 7581 ]

Current indicators

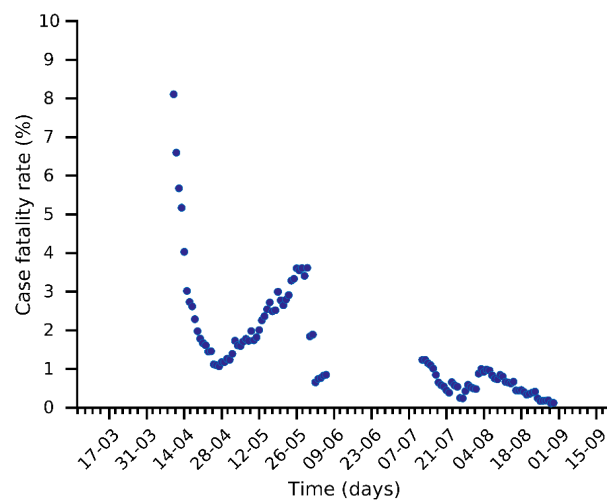
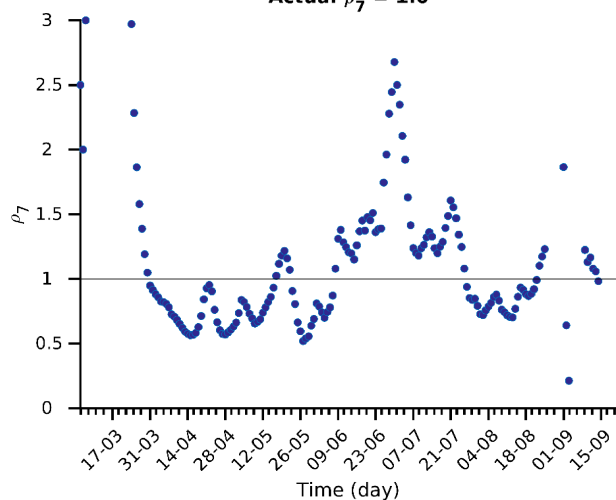
A <sub>14</sub>	EPG	CFR
97	95	0.00 %



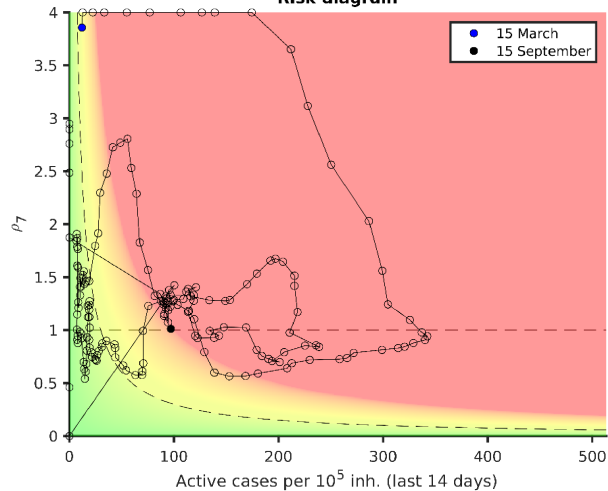
BIOCOM-Cov2 Degree = 7



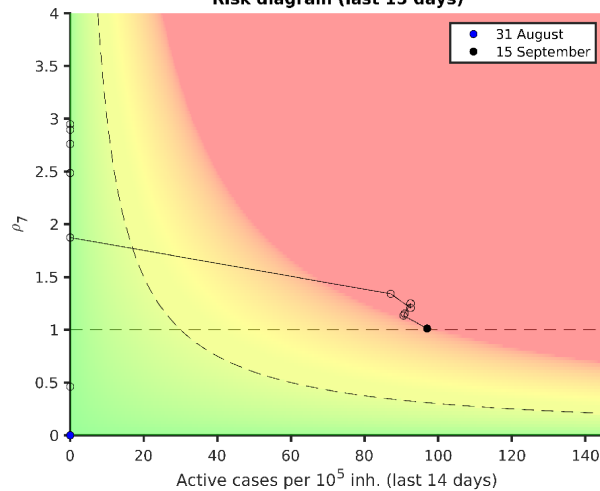
Actual  $\rho_7 = 1.0$



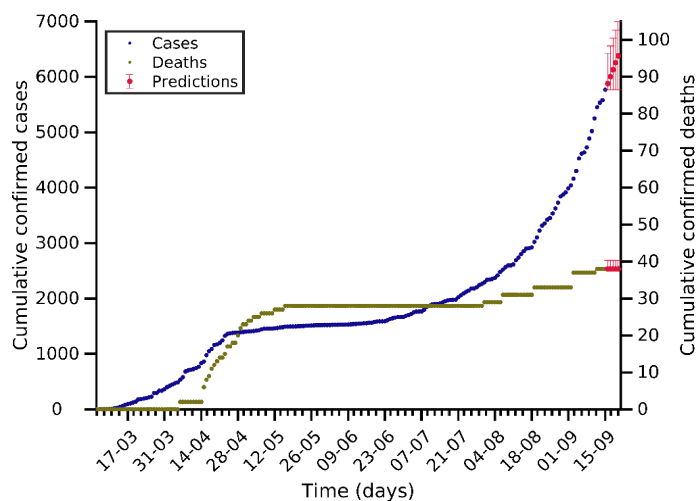
Risk diagram



Risk diagram (last 15 days)



# Slovakia 15-09-2020. Pop: 5.5M. Cumulative incidence: 106/10<sup>5</sup>

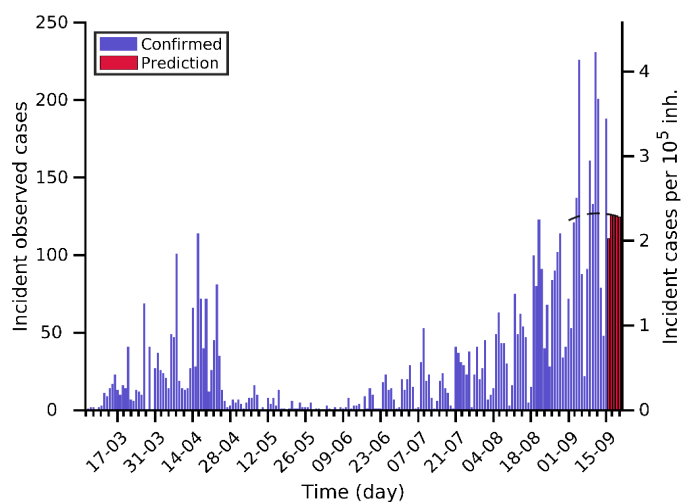


Predictions for next days

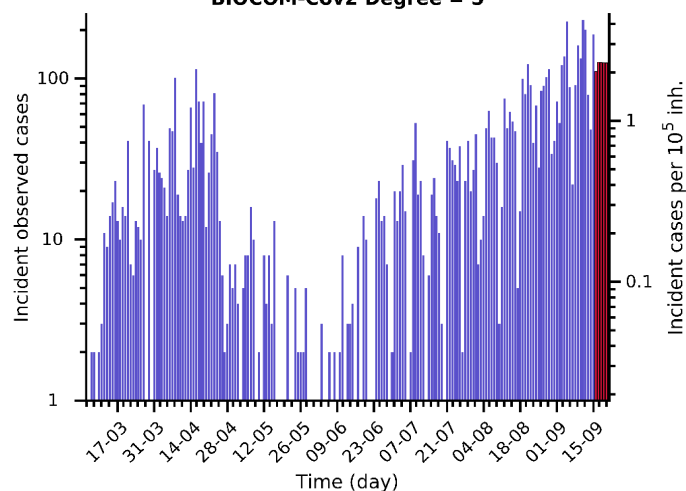
Day	Number of cases	95% Confidence Interval
16-09-2020	5879 (+111)	[ 5768 - 6423 ]
18-09-2020	6130 (+126)	[ 5768 - 6697 ]
20-09-2020	6380 (+125)	[ 5768 - 6996 ]

Current indicators

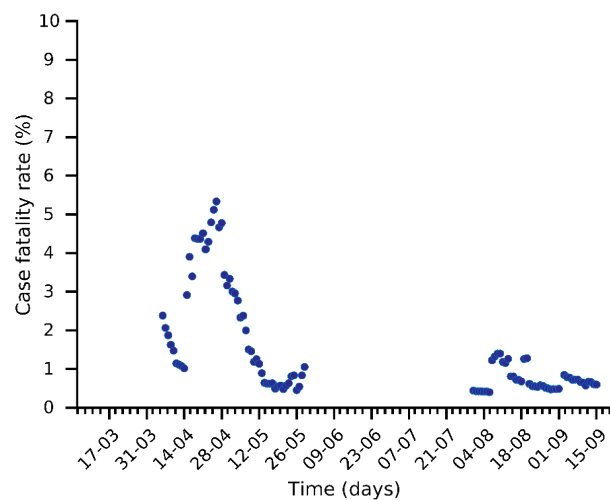
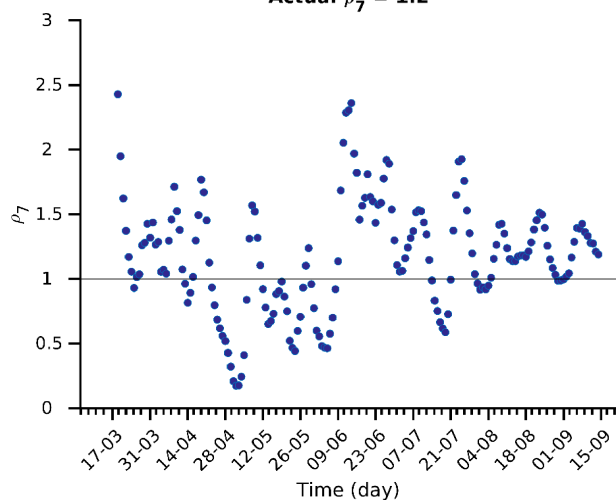
A <sub>14</sub>	EPG	CFR
33	39	0.60 %



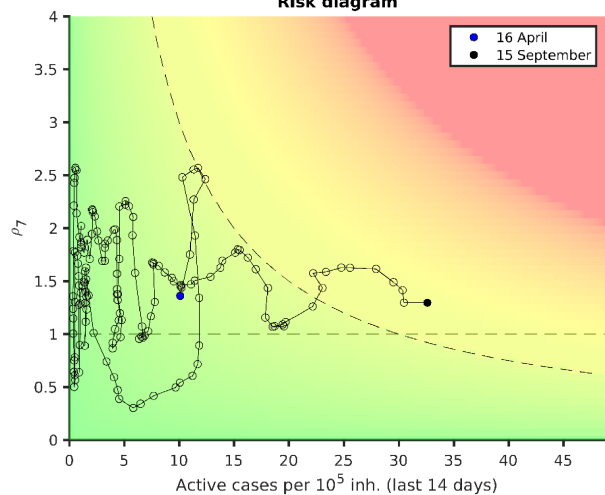
BIOCOM-Cov2 Degree = 5



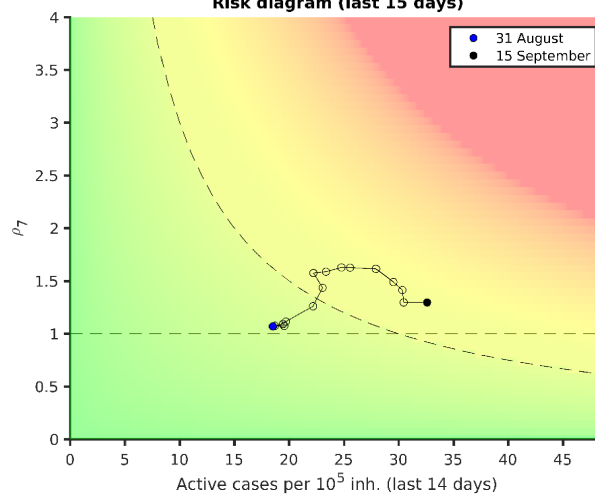
Actual  $\rho_7 = 1.2$



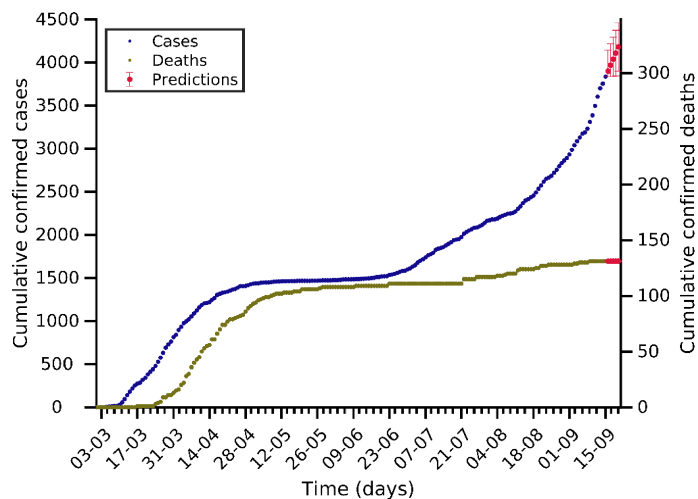
Risk diagram



Risk diagram (last 15 days)



# Slovenia 15-09-2020. Pop: 2.1M. Cumulative incidence: 185/10<sup>5</sup>

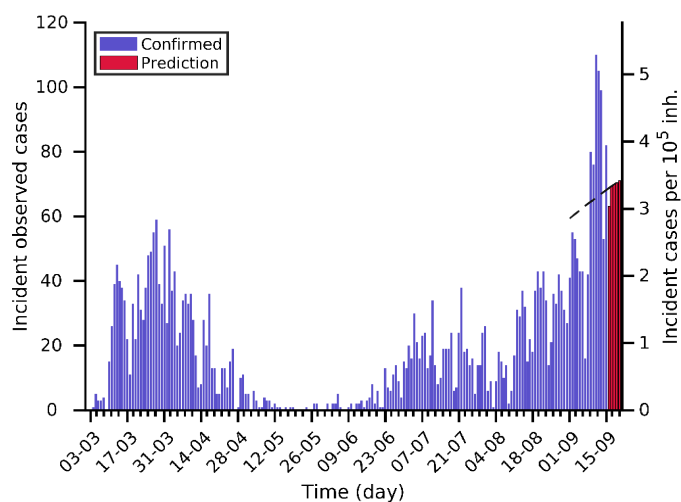


Predictions for next days

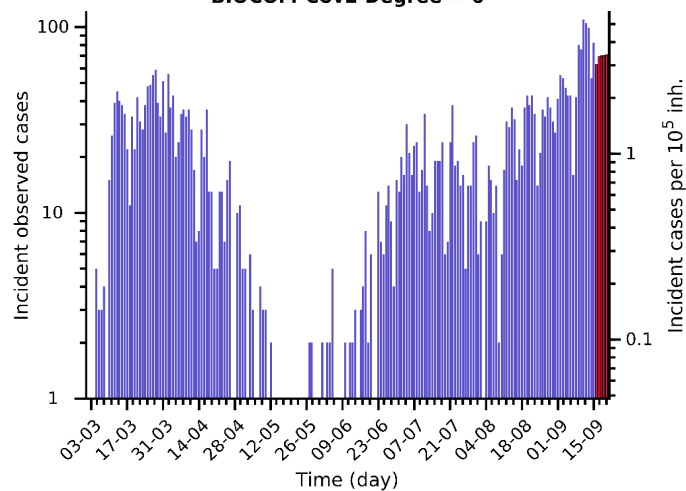
Day	Number of cases	95% Confidence Interval
16-09-2020	3900 (+63)	[ 3837 - 4144 ]
18-09-2020	4039 (+70)	[ 3837 - 4294 ]
20-09-2020	4181 (+71)	[ 3903 - 4459 ]

Current indicators

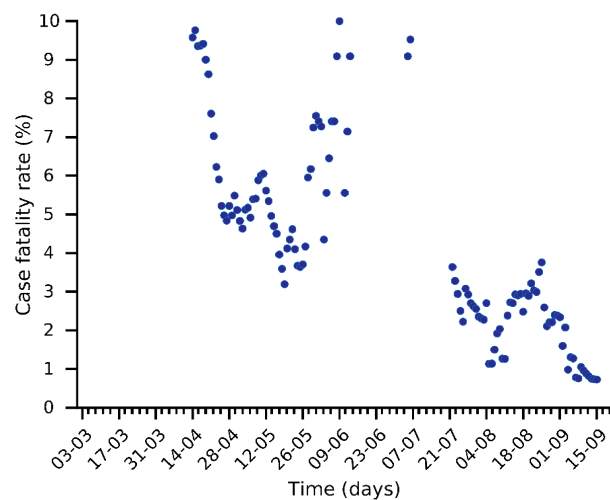
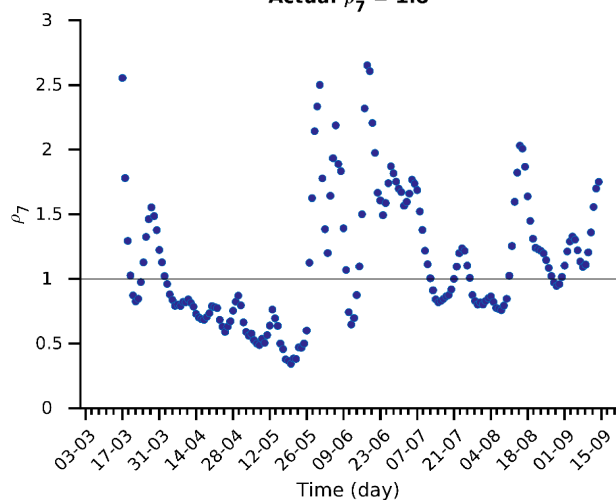
A <sub>14</sub>	EPG	CFR
43	76	0.72 %



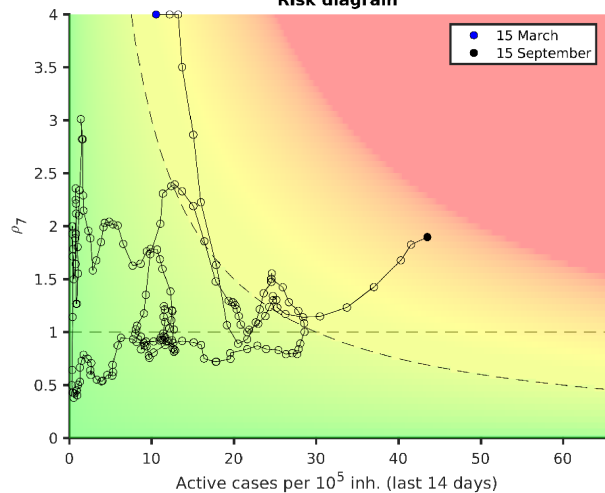
BIOCOM-Cov2 Degree = 6



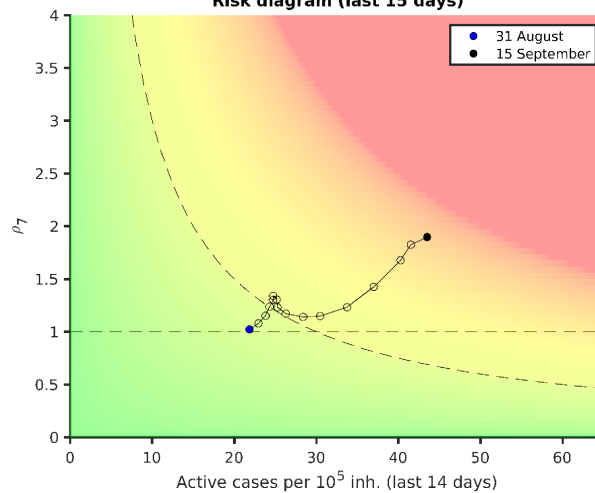
Actual  $\rho_7 = 1.8$



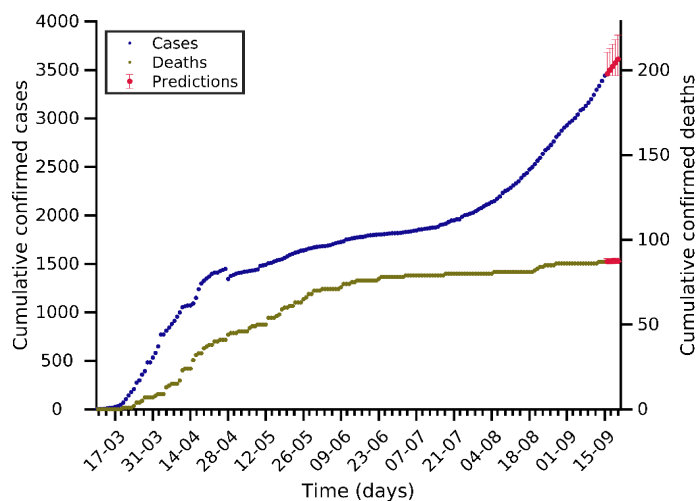
Risk diagram



Risk diagram (last 15 days)



# Lithuania 15-09-2020. Pop: 2.7M. Cumulative incidence: 126/10<sup>5</sup>

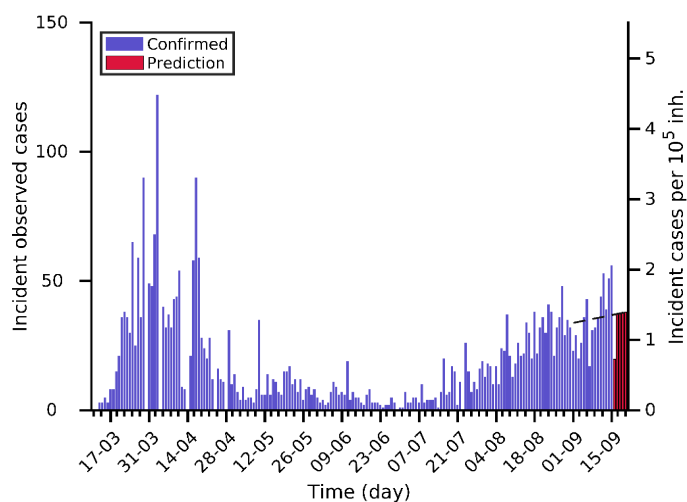


Predictions for next days

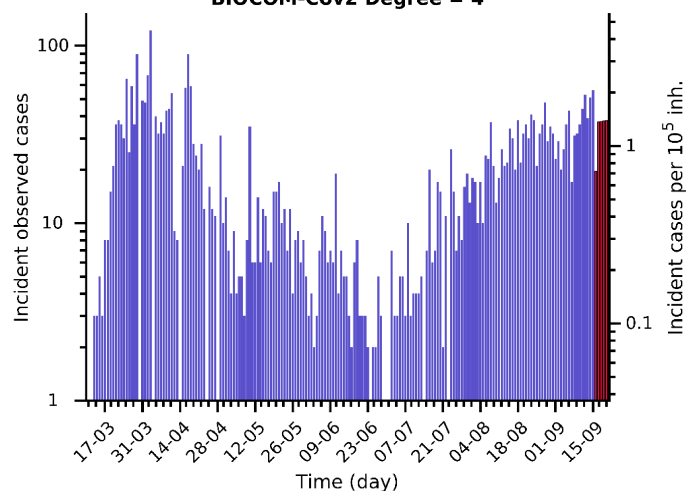
Day	Number of cases	95% Confidence Interval
16-09-2020	3462 (+20)	[ 3442 - 3681 ]
18-09-2020	3536 (+37)	[ 3442 - 3765 ]
20-09-2020	3612 (+38)	[ 3442 - 3861 ]

Current indicators

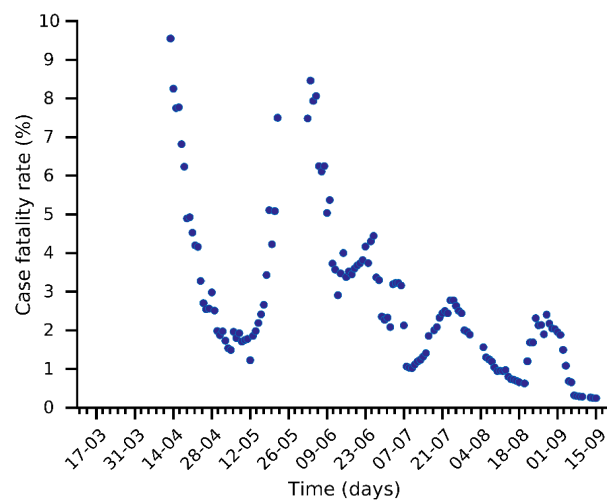
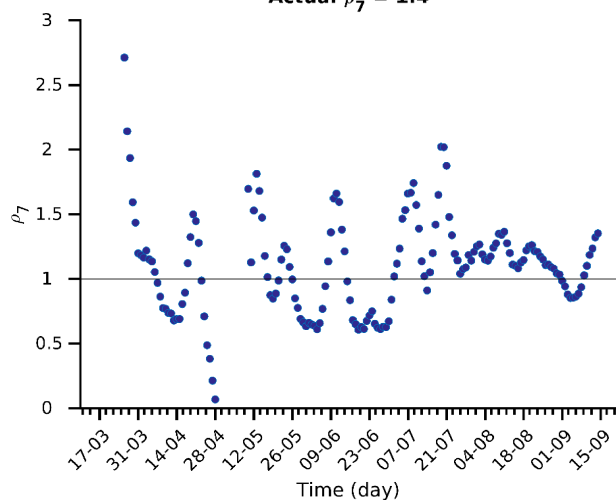
A <sub>14</sub>	EPG	CFR
19	25	0.24 %



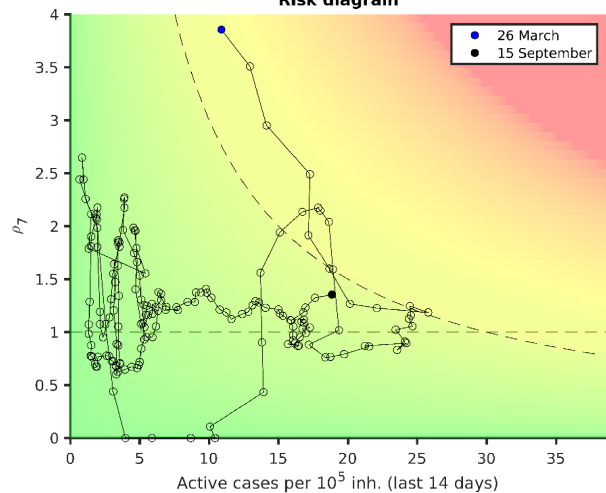
BIOCOM-Cov2 Degree = 4



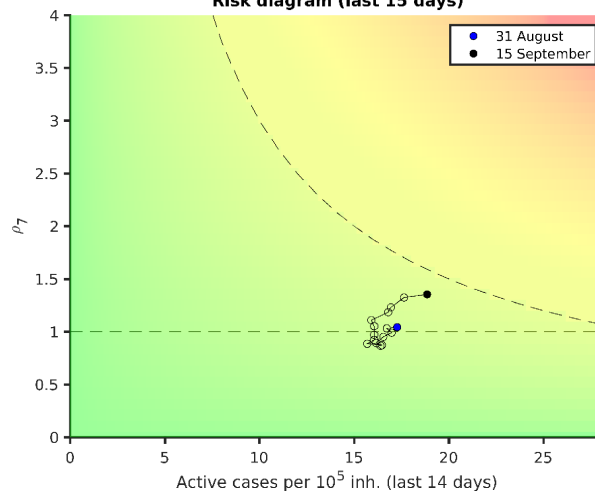
Actual  $\rho_7 = 1.4$



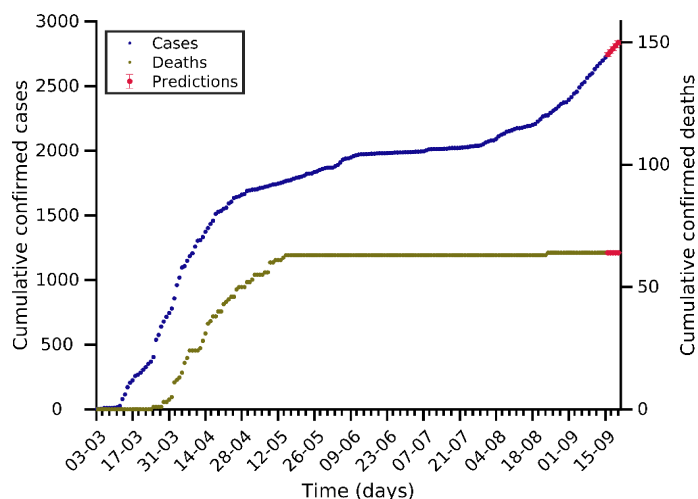
Risk diagram



Risk diagram (last 15 days)



# Estonia 15-09-2020. Pop: 1.3M. Cumulative incidence: 205/10<sup>5</sup>

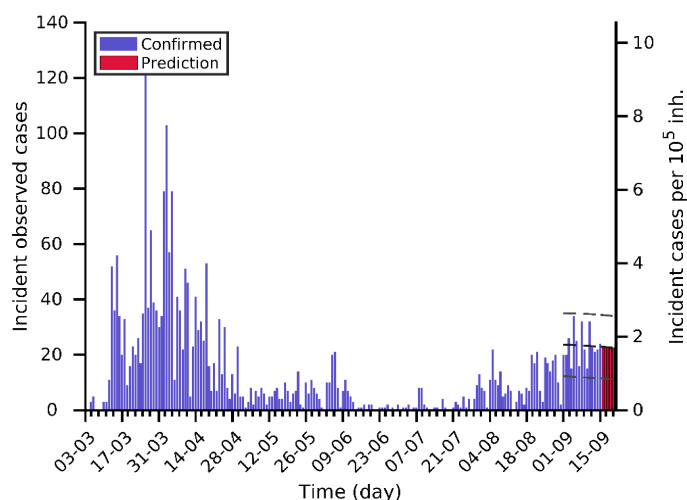


Predictions for next days

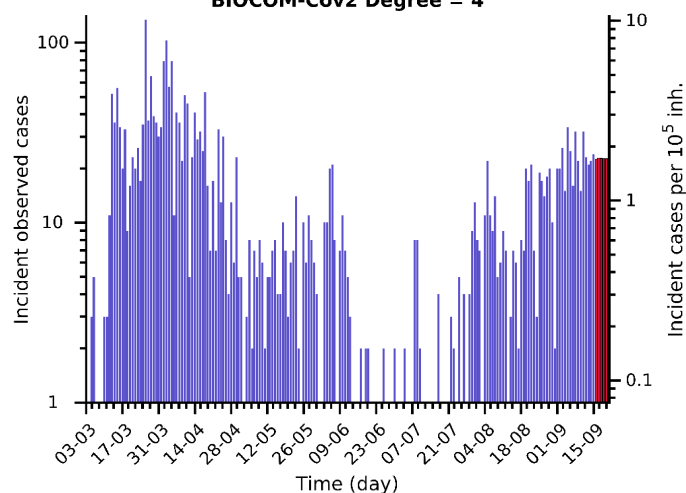
Day	Number of cases	95% Confidence Interval
16-09-2020	2745 (+23)	[ 2730 - 2759 ]
18-09-2020	2790 (+23)	[ 2775 - 2805 ]
20-09-2020	2835 (+23)	[ 2820 - 2851 ]

Current indicators

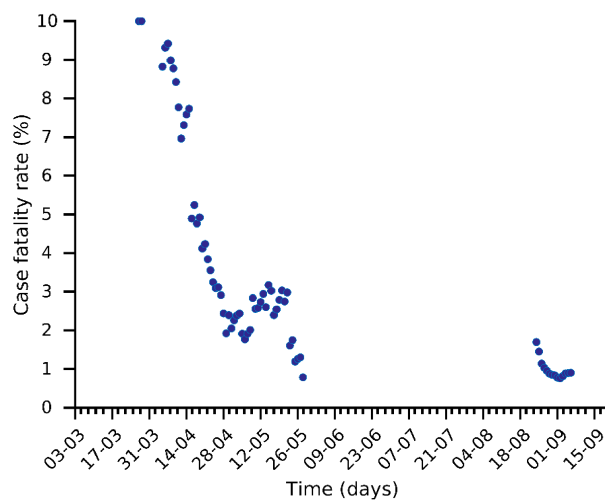
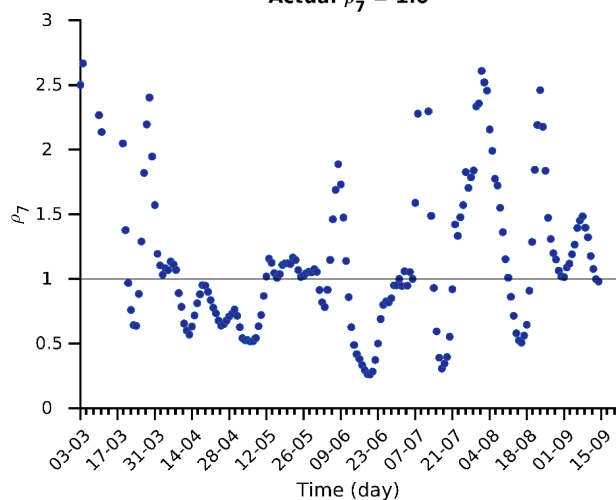
A <sub>14</sub>	EPG	CFR
25	24	0.00 %



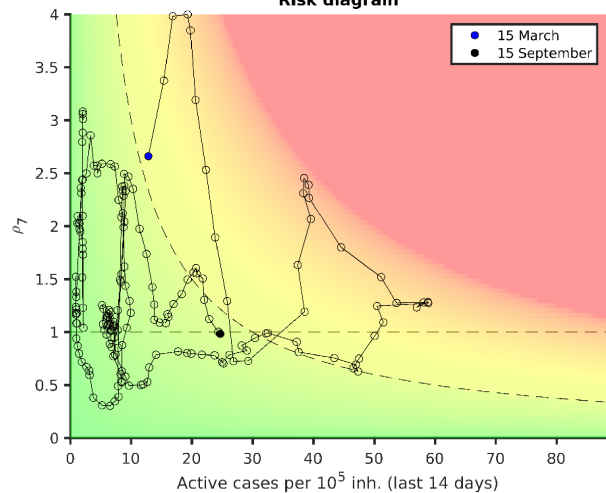
BIOCOM-Cov2 Degree = 4



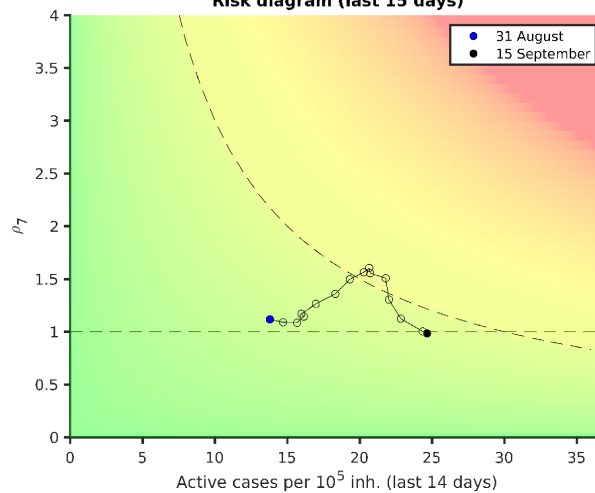
Actual  $\rho_7 = 1.0$



Risk diagram

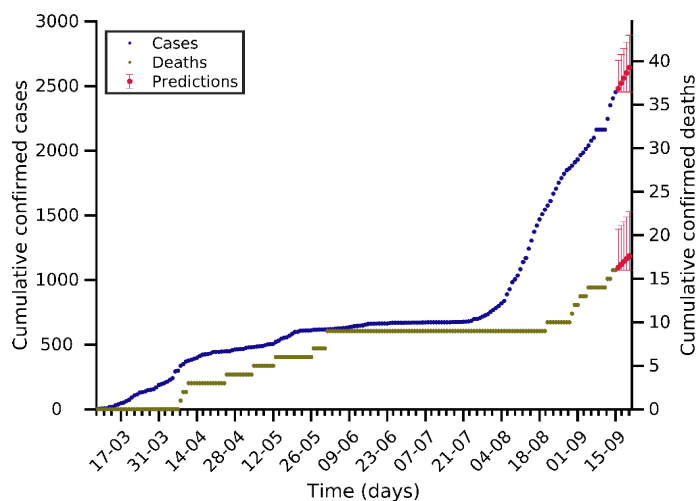


Risk diagram (last 15 days)





# Malta 15-09-2020. Pop: 0.4M. Cumulative incidence: 556/10<sup>5</sup>

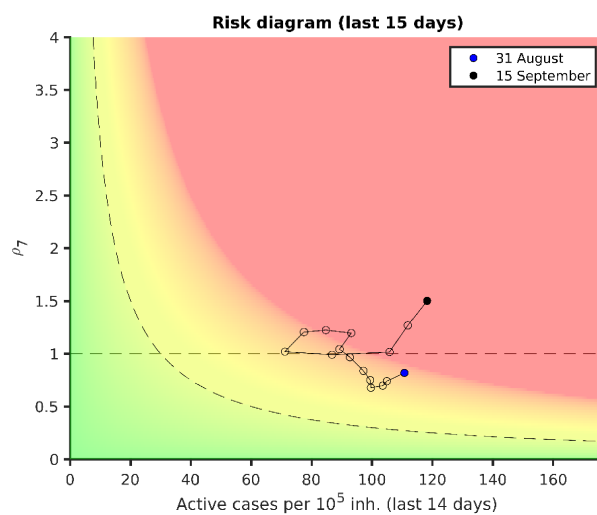
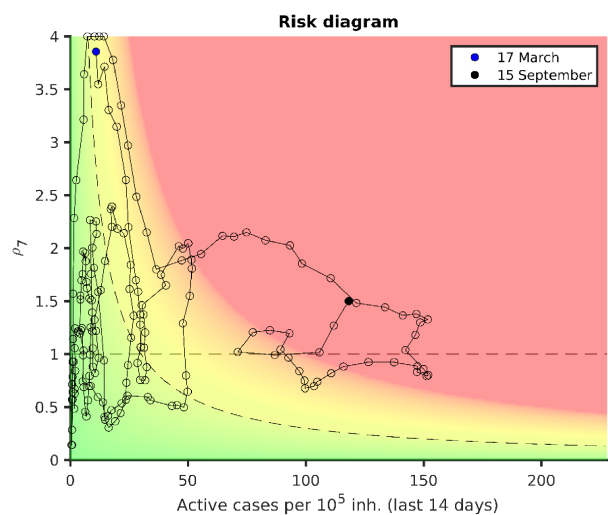
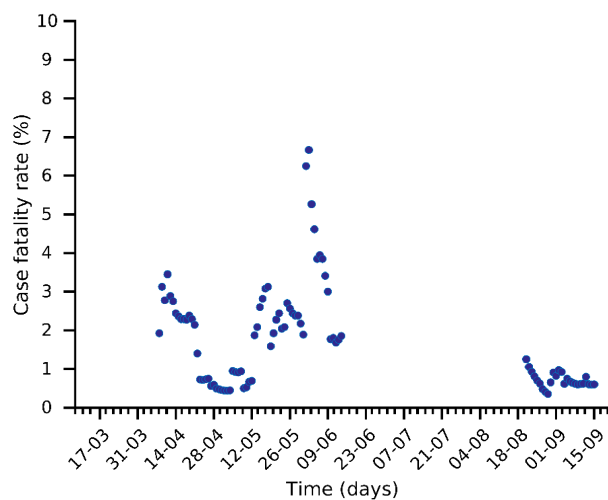
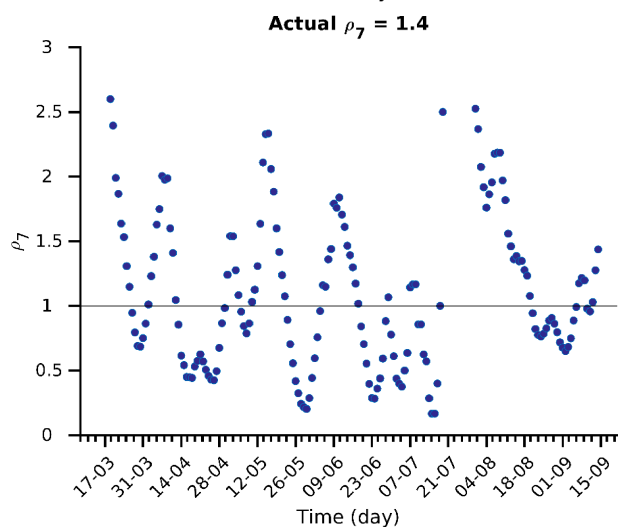
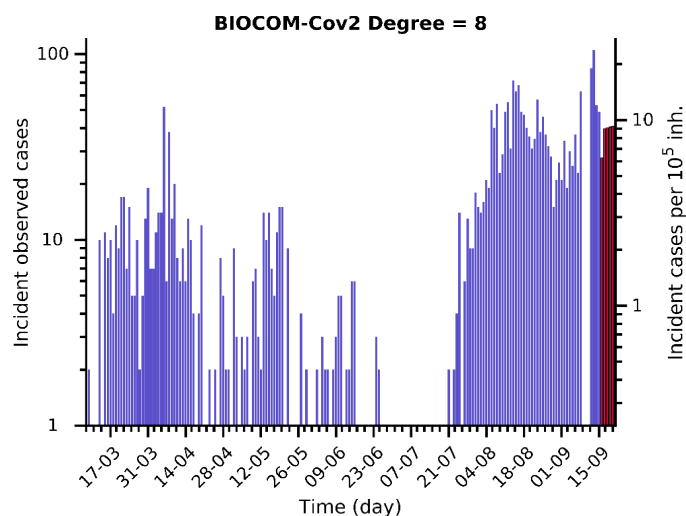
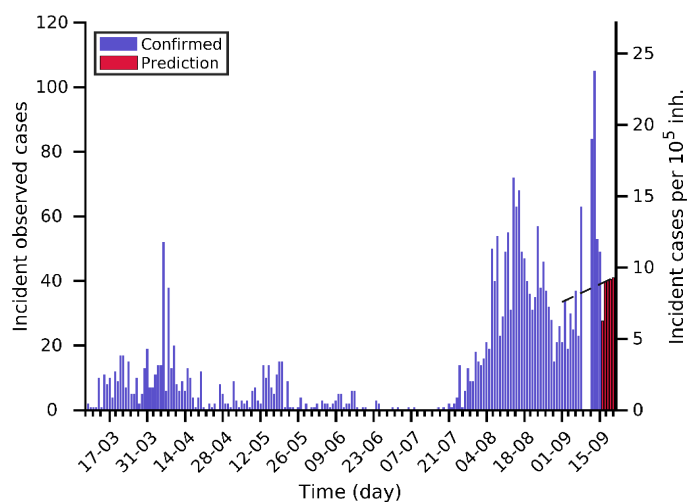


Predictions for next days

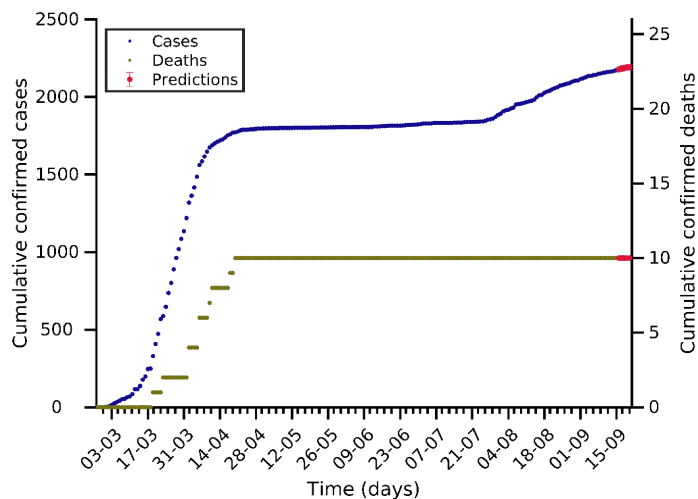
Day	Number of cases	95% Confidence Interval
16-09-2020	2482 (+28)	[ 2454 - 2700 ]
18-09-2020	2562 (+40)	[ 2454 - 2790 ]
20-09-2020	2643 (+41)	[ 2454 - 2893 ]

Current indicators

A <sub>14</sub>	EPG	CFR
118	170	0.60 %



# Iceland 15-09-2020. Pop: 0.3M. Cumulative incidence: 637/10<sup>5</sup>

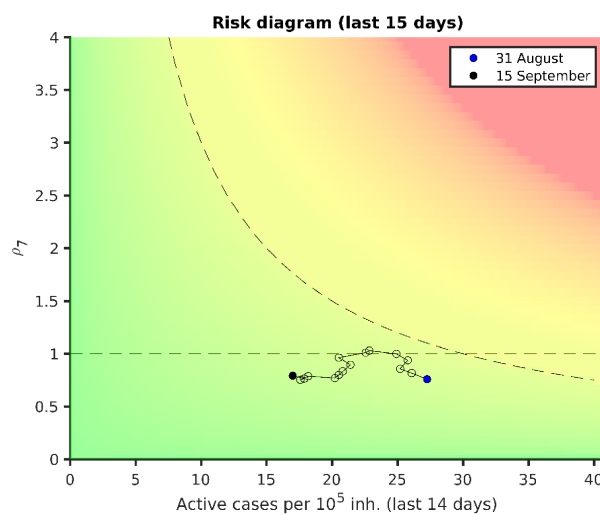
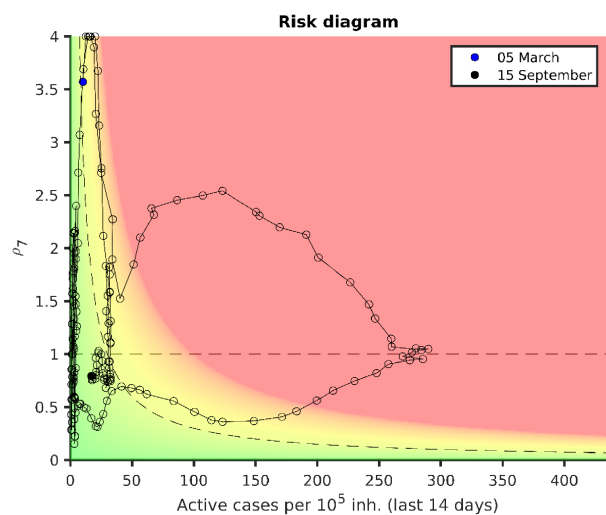
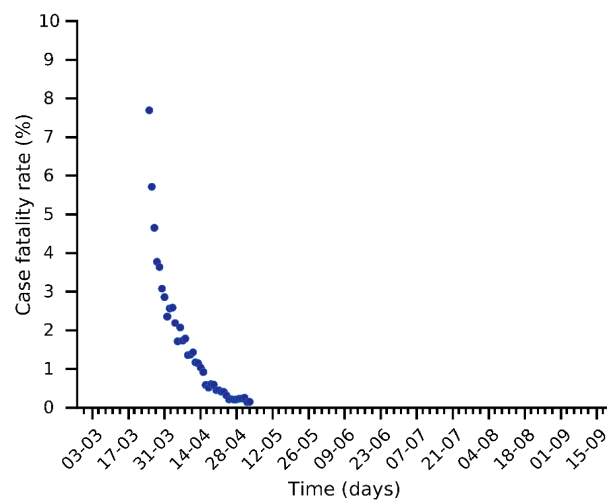
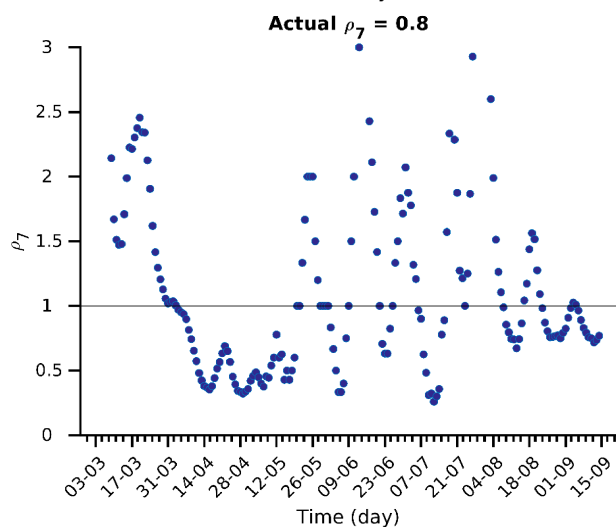
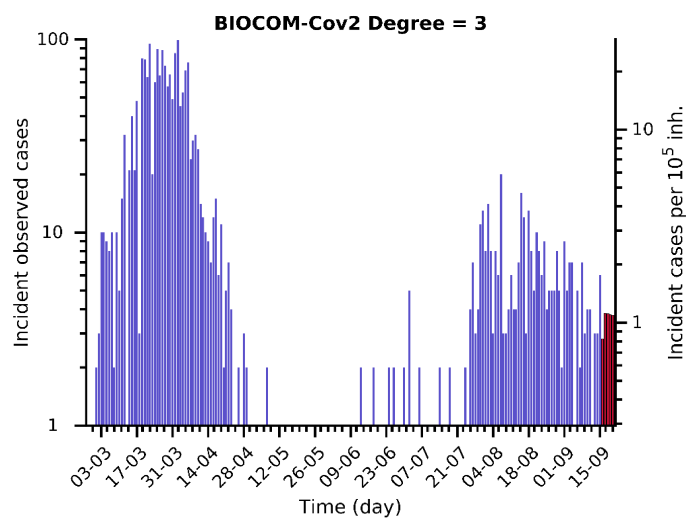
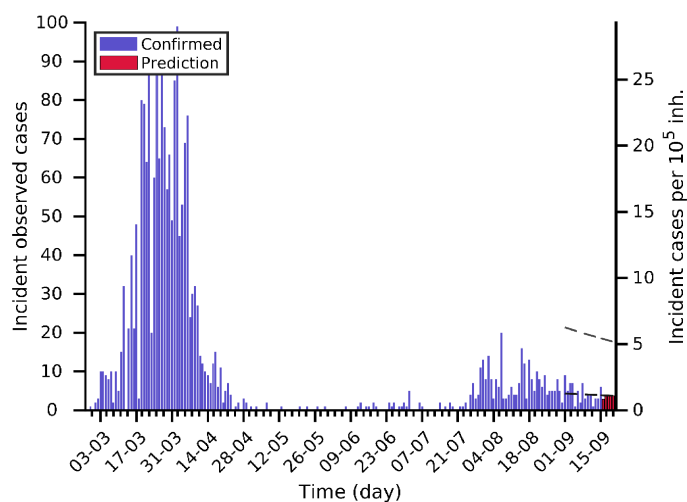


Predictions for next days

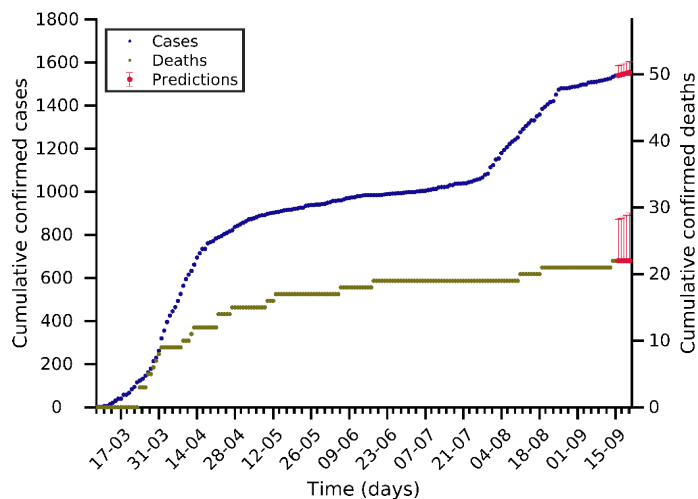
Day	Number of cases	95% Confidence Interval
16-09-2020	2177 (+3)	[ 2174 - 2193 ]
18-09-2020	2184 (+4)	[ 2174 - 2201 ]
20-09-2020	2192 (+4)	[ 2174 - 2210 ]

Current indicators

A <sub>14</sub>	EPG	CFR
17	13	0.00 %



# Cyprus 15-09-2020. Pop: 1.2M. Cumulative incidence: 128/10<sup>5</sup>

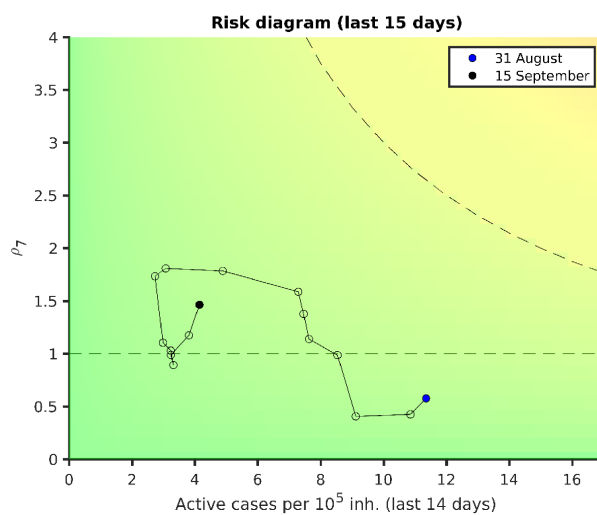
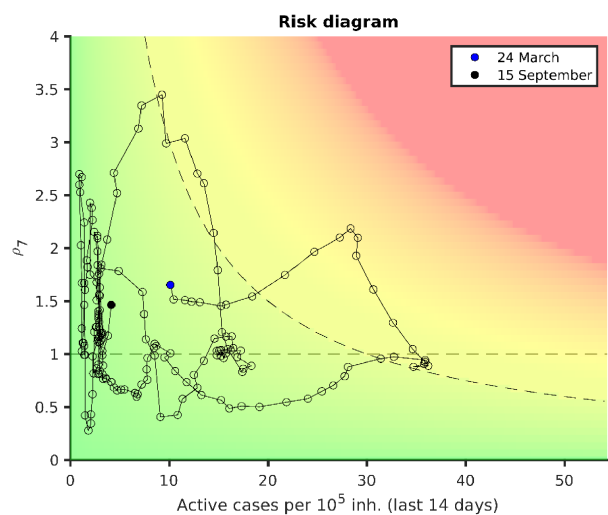
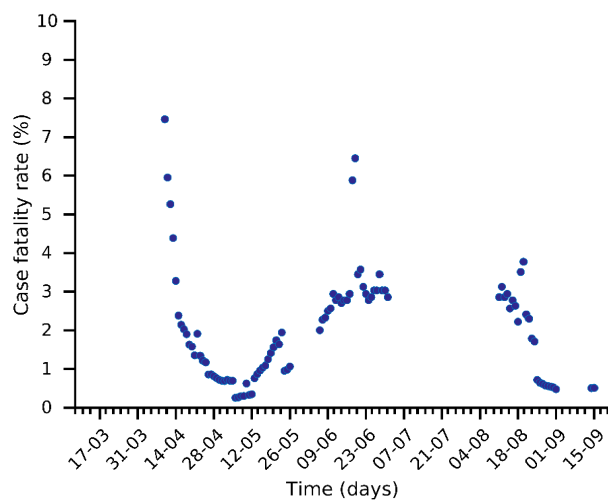
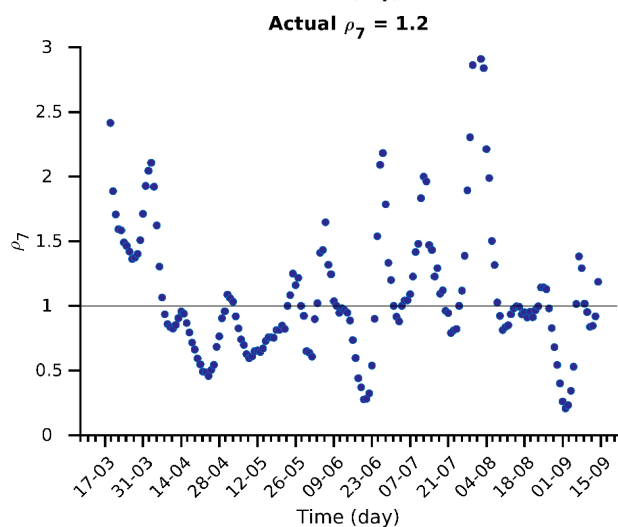
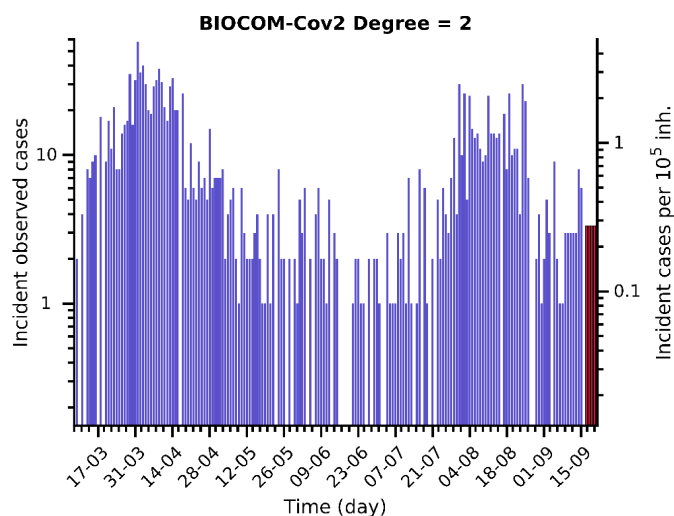
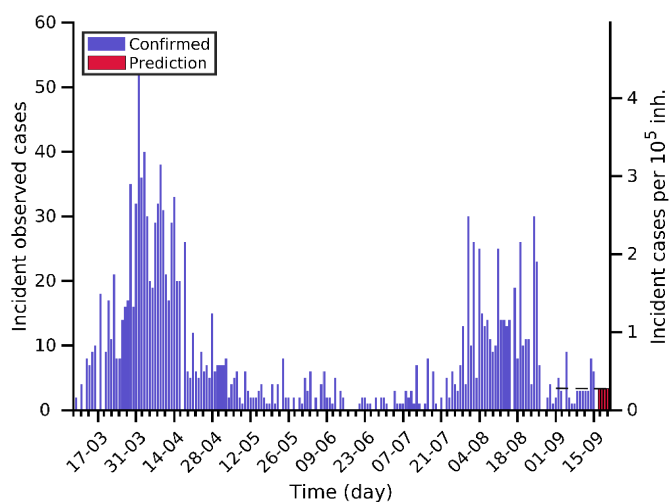


Predictions for next days

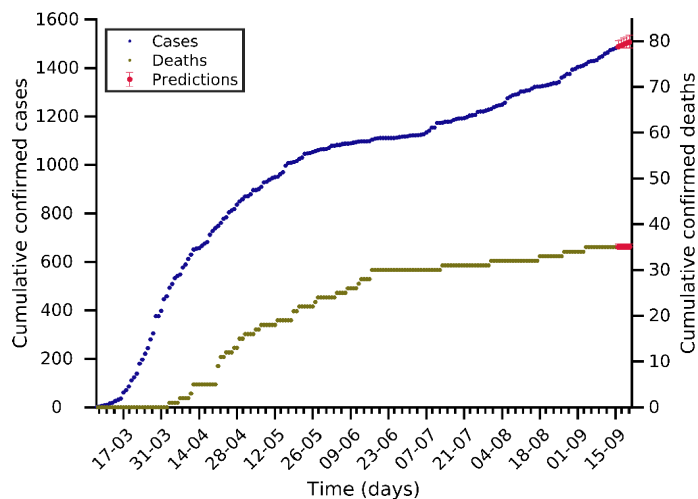
Day	Number of cases	95% Confidence Interval
16-09-2020	1540 (+0)	[ 1540 - 1585 ]
18-09-2020	1547 (+3)	[ 1540 - 1594 ]
20-09-2020	1553 (+3)	[ 1540 - 1604 ]

Current indicators

A <sub>14</sub>	EPG	CFR
4	5	0.51 %



# Latvia 15-09-2020. Pop: 1.9M. Cumulative incidence: 79/10<sup>5</sup>

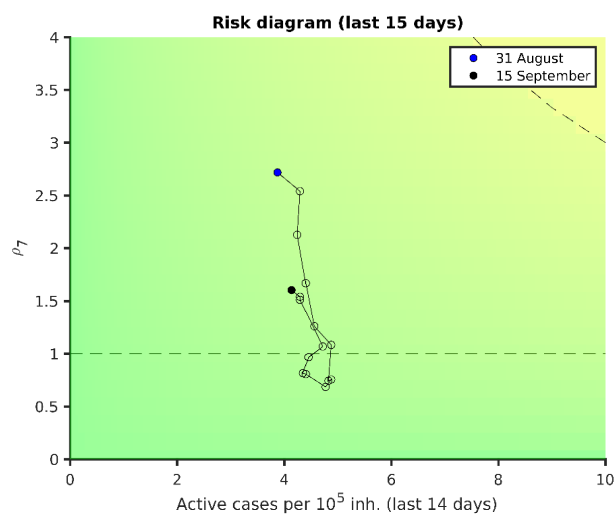
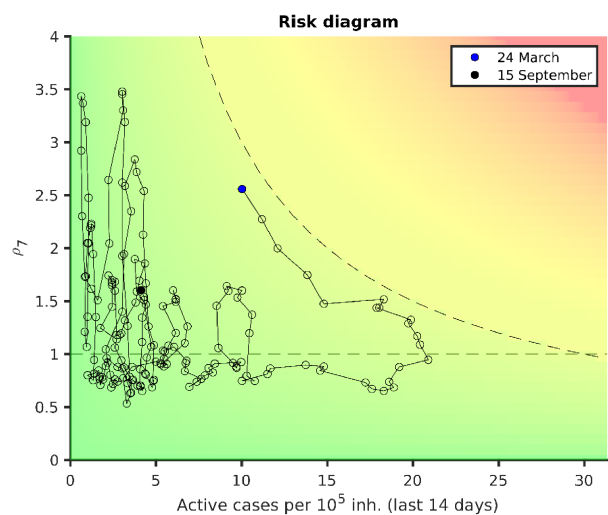
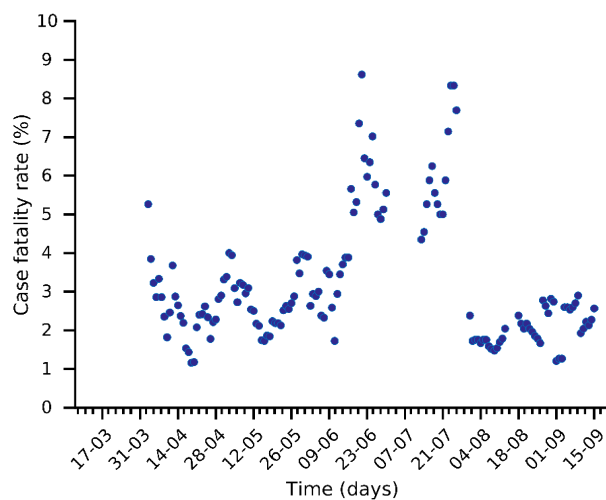
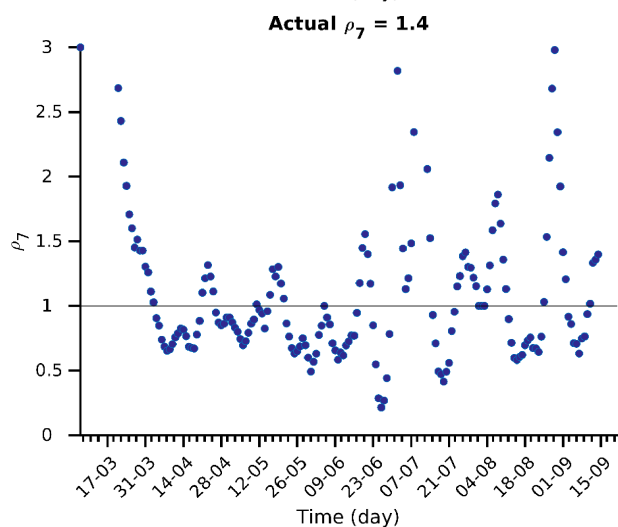
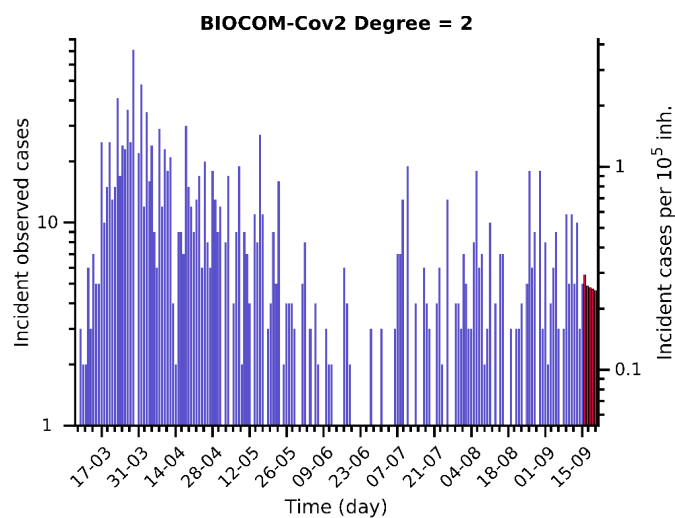
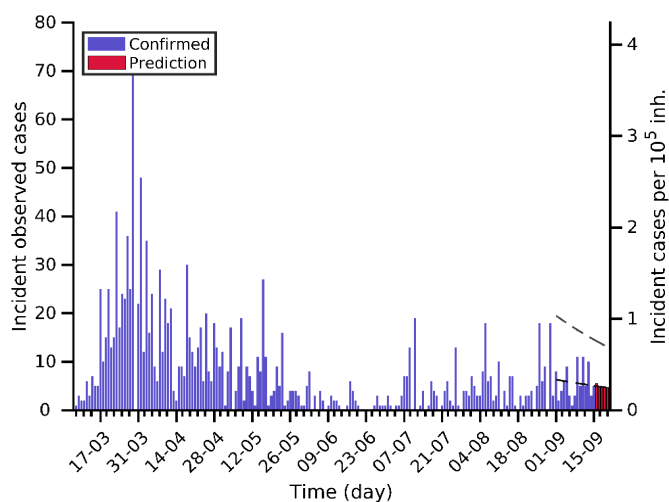


Predictions for next days

Day	Number of cases	95% Confidence Interval
16-09-2020	1488 (+6)	[ 1482 - 1513 ]
18-09-2020	1497 (+5)	[ 1482 - 1524 ]
20-09-2020	1507 (+5)	[ 1482 - 1535 ]

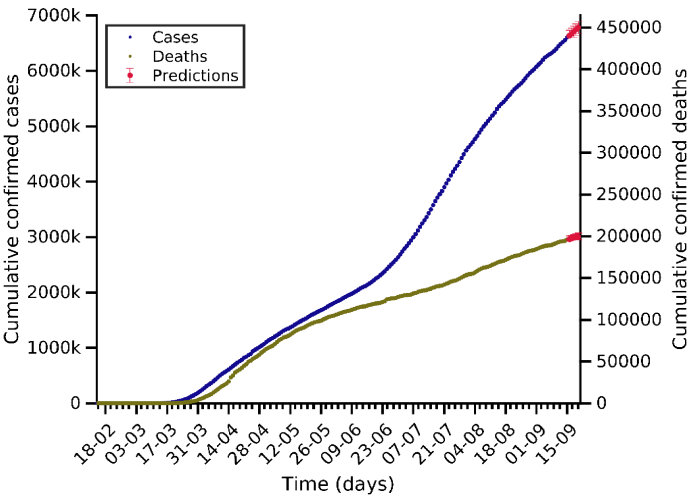
Current indicators

A <sub>14</sub>	EPG	CFR
4	6	2.56 %



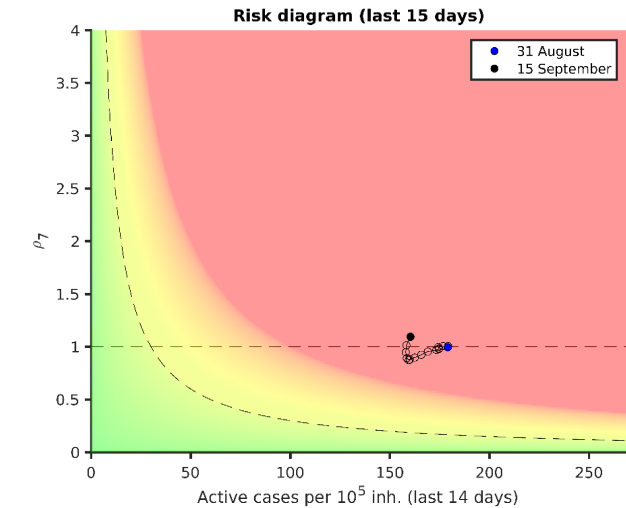
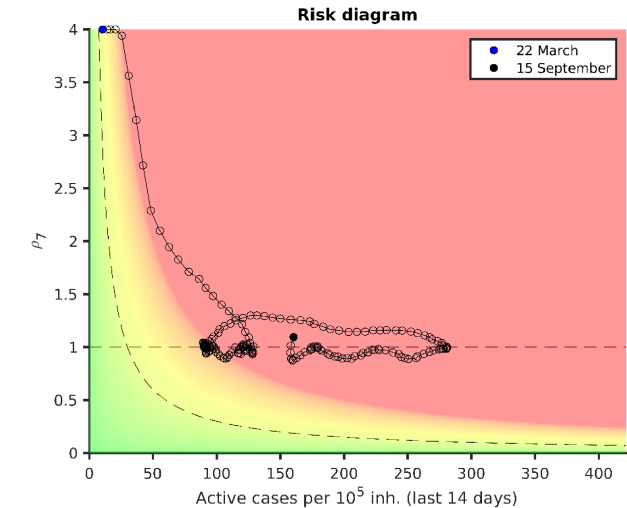
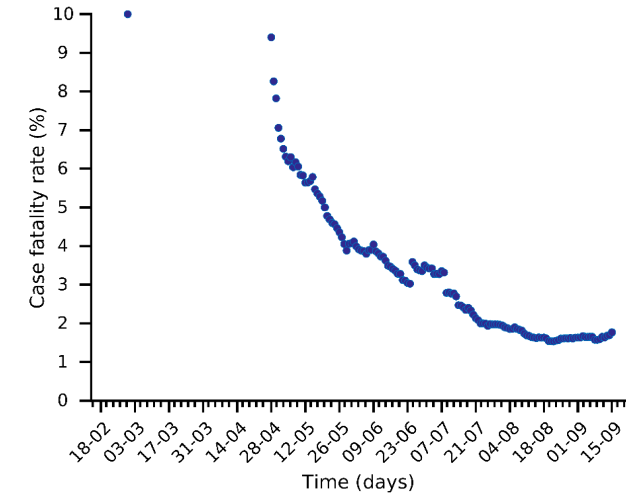
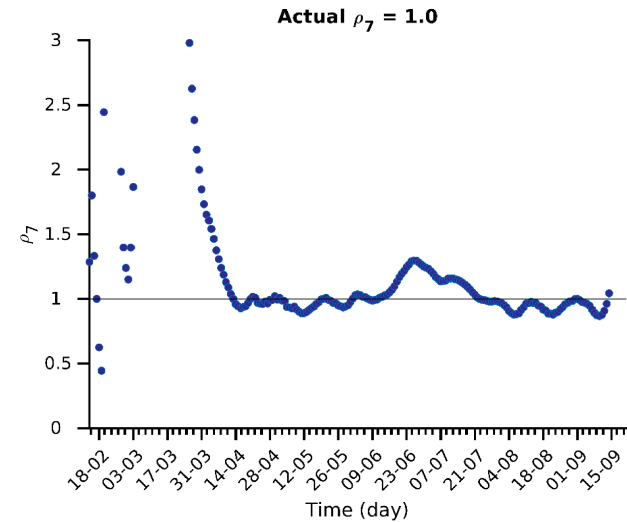
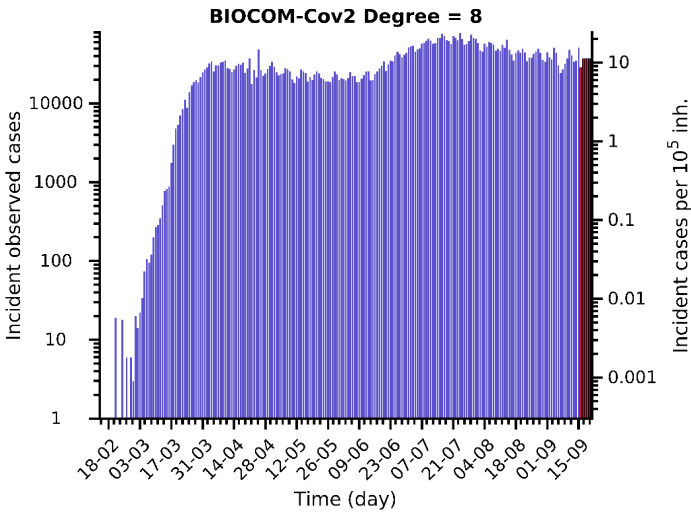
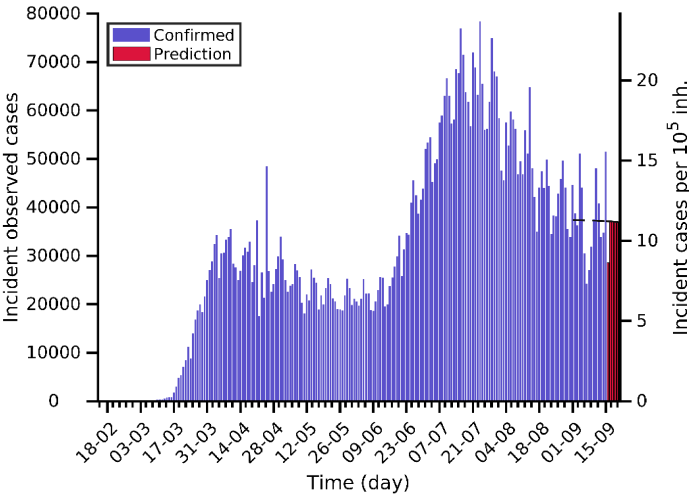
## **(2) Analysis and prediction of COVID-19 for other countries**

USA 15-09-2020. Pop: 331.0M. Cumulative incidence: 1996/10<sup>5</sup>

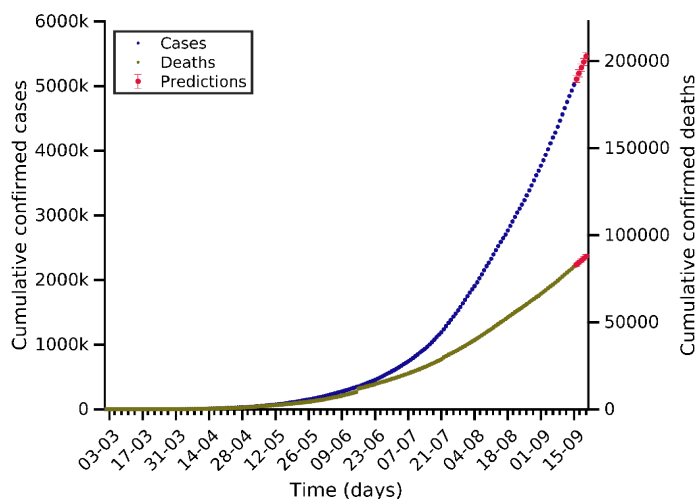


Predictions for next days		
Day	Number of cases	95% Confidence Interval
16-09-2020	6634870 (+28577)	[ 6606293 - 6731766 ]
18-09-2020	6709046 (+37073)	[ 6608356 - 6809736 ]
20-09-2020	6783097 (+37009)	[ 6674304 - 6891891 ]

Current indicators		
A <sub>14</sub>	EPG	CFR
160	167	1.76 %



# India 15-09-2020. Pop: 1353.0M. Cumulative incidence: 371/10<sup>5</sup>

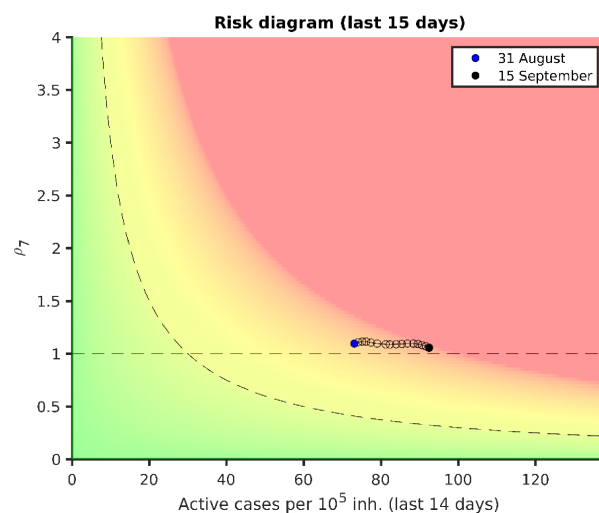
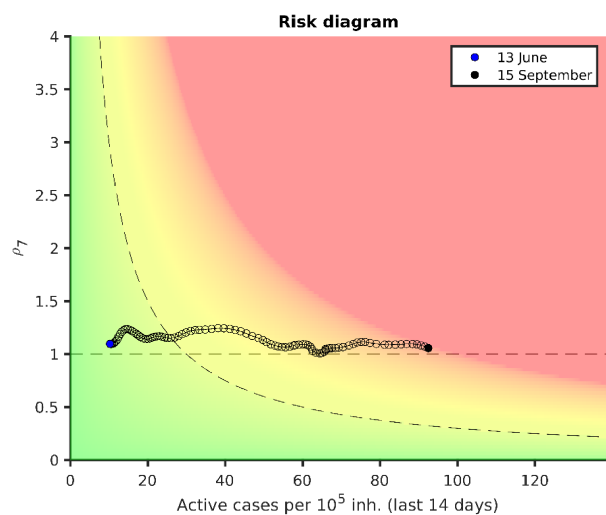
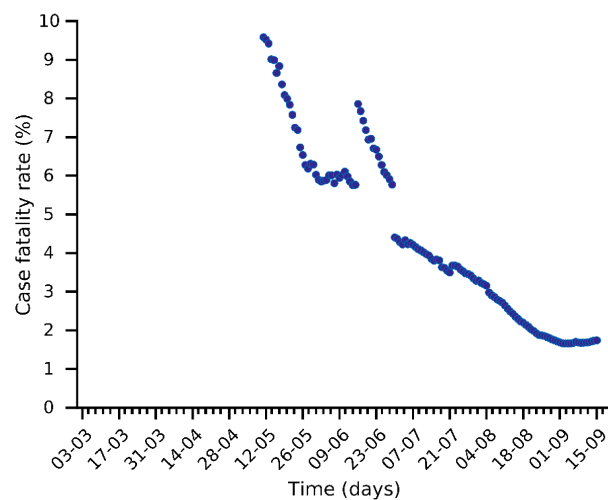
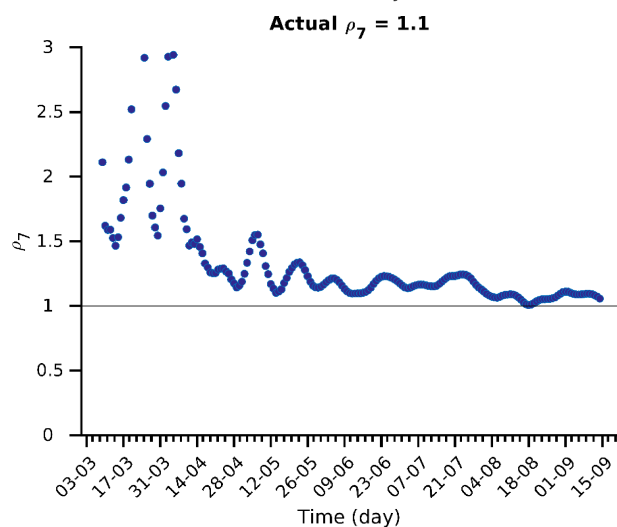
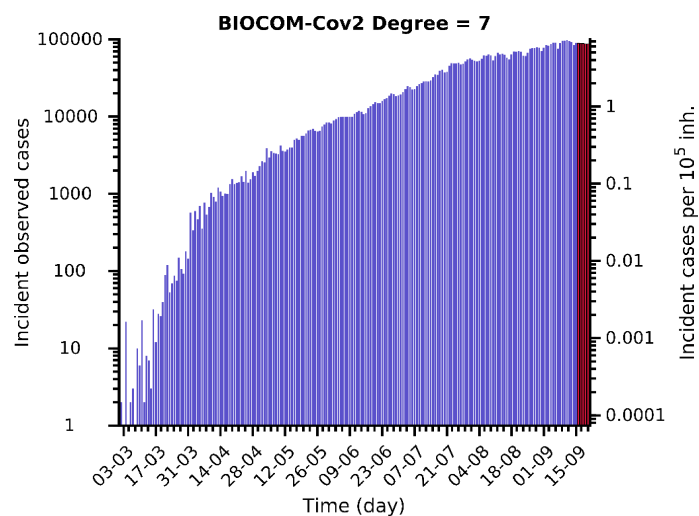
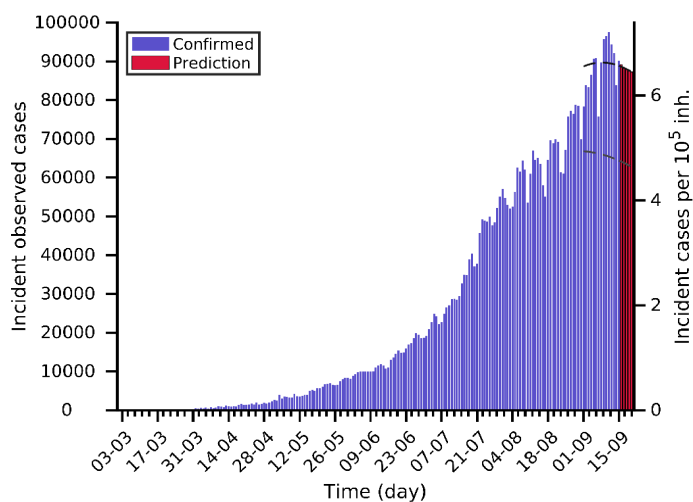


Predictions for next days

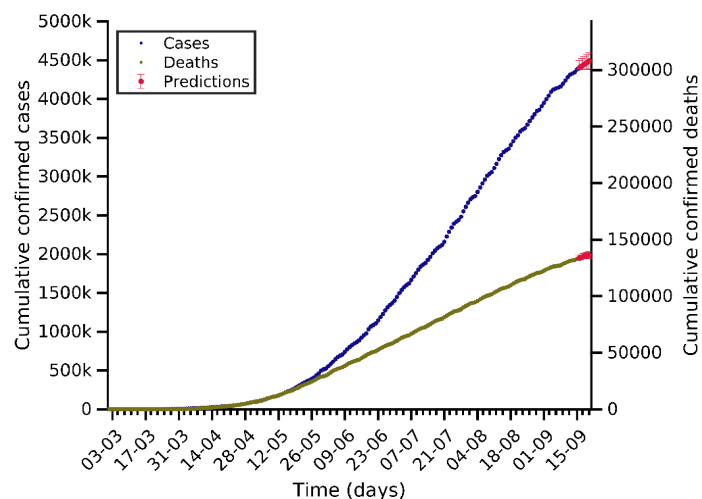
Day	Number of cases	95% Confidence Interval
16-09-2020	5109554 (+89195)	[ 5056100 - 5163007 ]
18-09-2020	5285855 (+87992)	[ 5230238 - 5341473 ]
20-09-2020	5460775 (+87273)	[ 5400508 - 5521042 ]

Current indicators

A <sub>14</sub>	EPG	CFR
92	98	1.74 %



# Brazil 15-09-2020. Pop: 212.6M. Cumulative incidence: 2062/10<sup>5</sup>

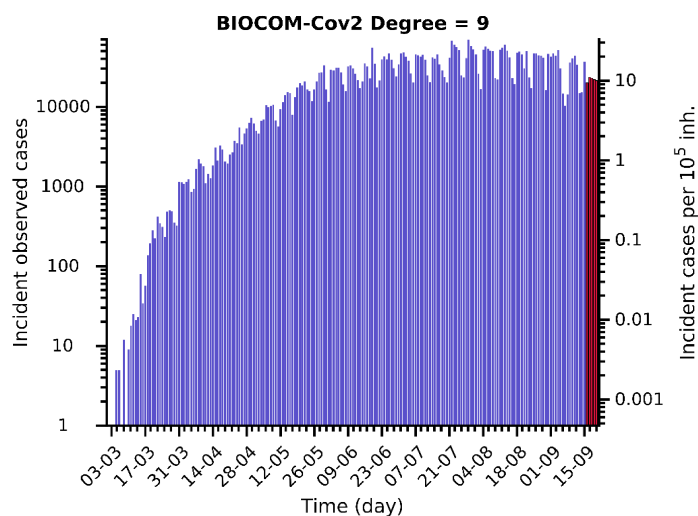
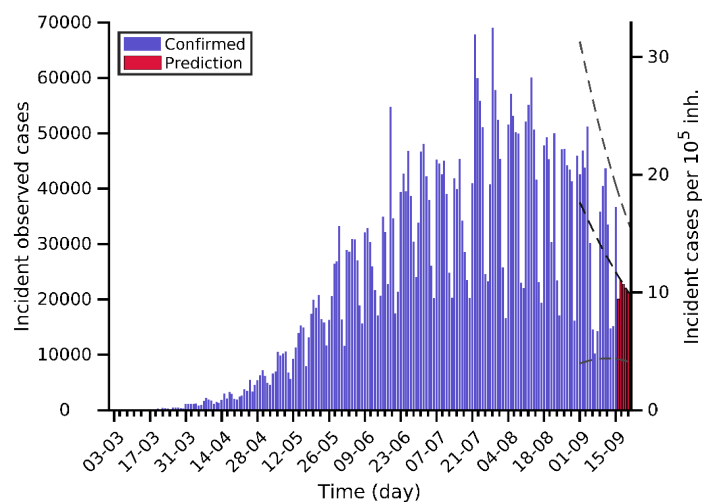


Predictions for next days

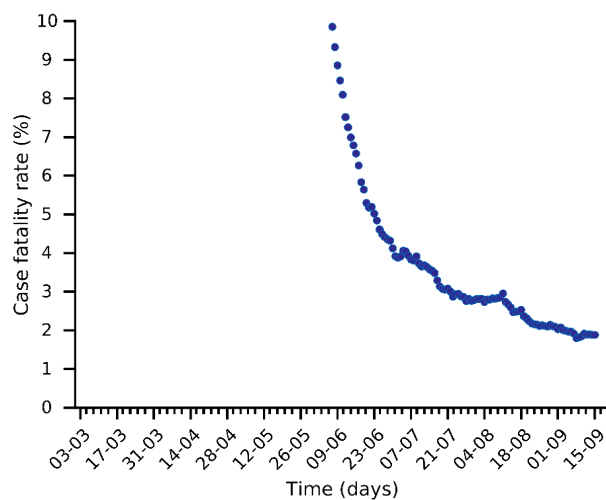
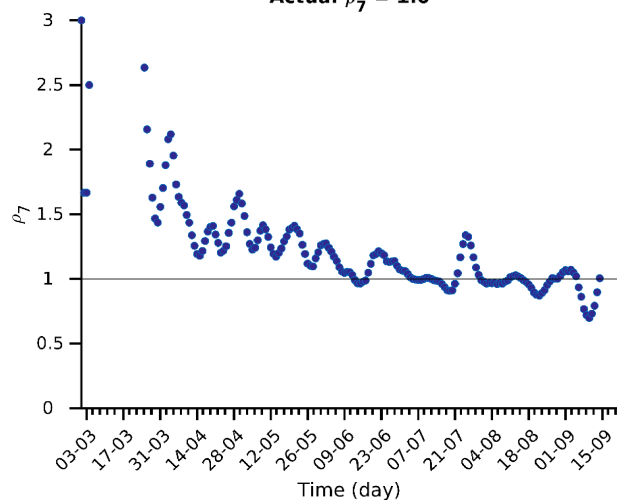
Day	Number of cases	95% Confidence Interval
16-09-2020	4402304 (+20041)	[ 4382263 - 4496926 ]
18-09-2020	4448535 (+22754)	[ 4382263 - 4546094 ]
20-09-2020	4491946 (+21362)	[ 4388684 - 4595207 ]

Current indicators

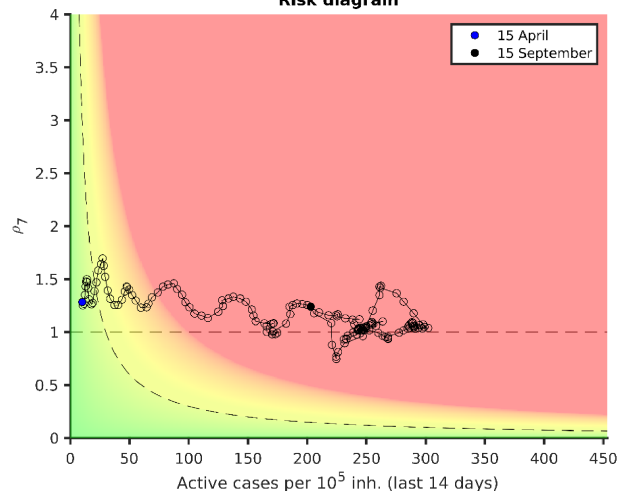
A <sub>14</sub>	EPG	CFR
203	204	1.88 %



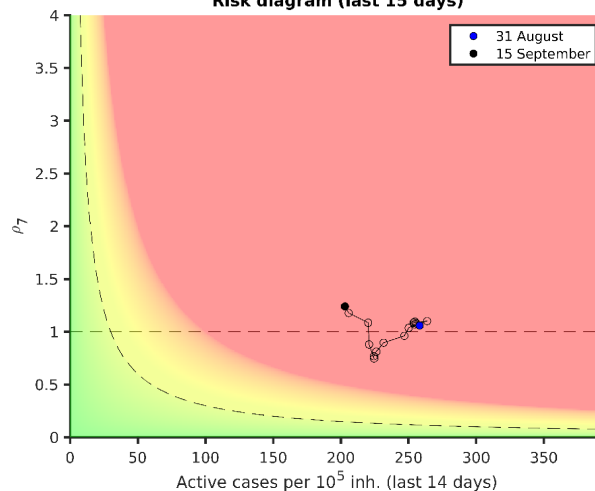
Actual  $\rho_7 = 1.0$



Risk diagram

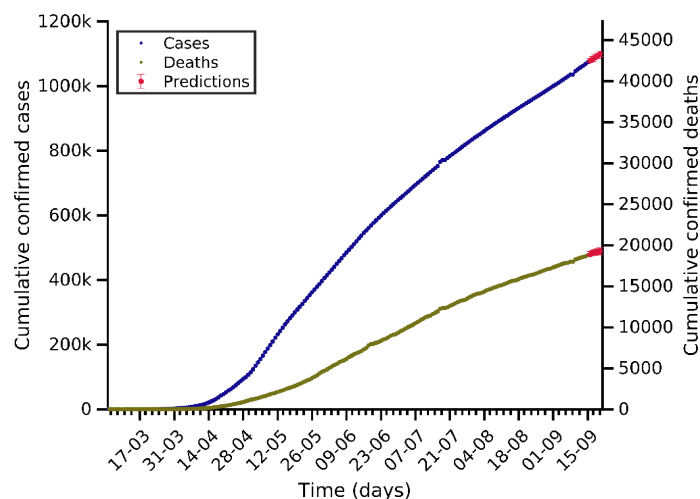


Risk diagram (last 15 days)





# Russia 15-09-2020. Pop: 145.9M. Cumulative incidence: 736/10<sup>5</sup>

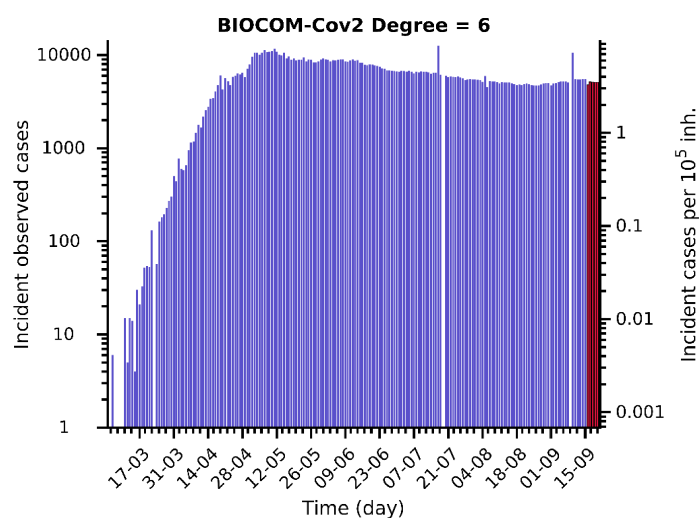
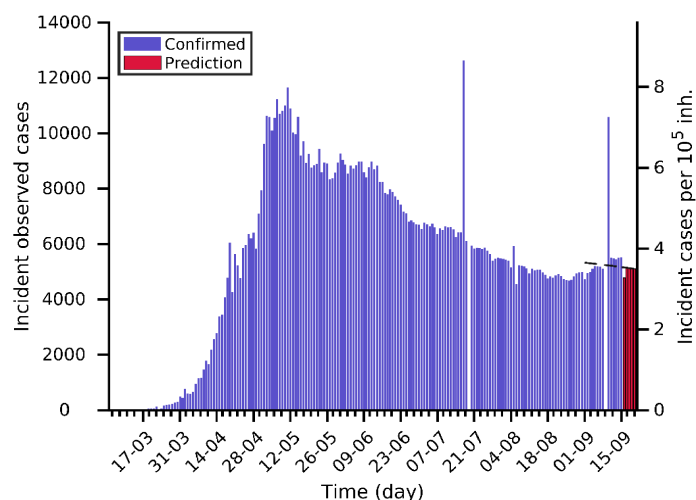


Predictions for next days

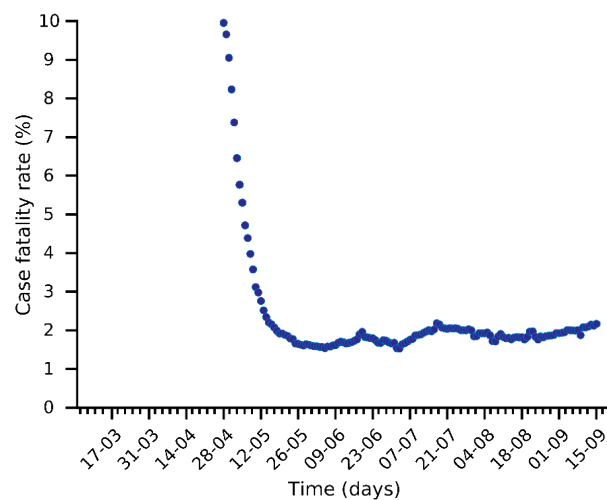
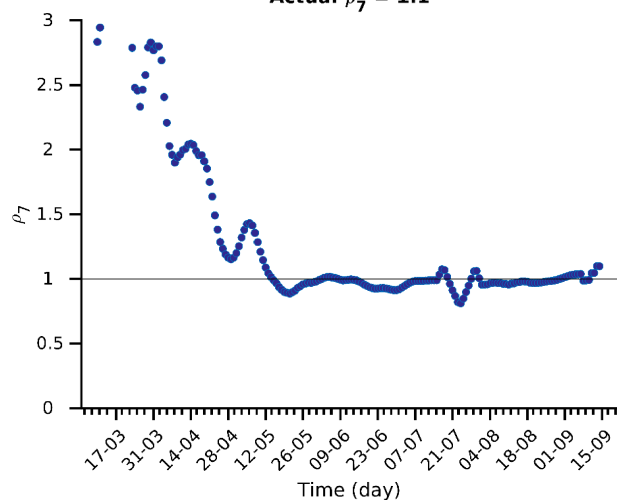
Day	Number of cases	95% Confidence Interval
16-09-2020	1078626 (+4777)	[ 1073849 - 1085924 ]
18-09-2020	1088897 (+5129)	[ 1081317 - 1096477 ]
20-09-2020	1099117 (+5103)	[ 1090940 - 1107293 ]

Current indicators

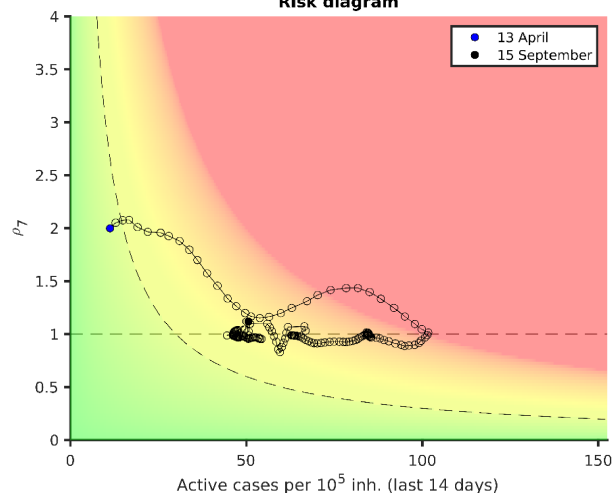
A <sub>14</sub>	EPG	CFR
51	56	2.17 %



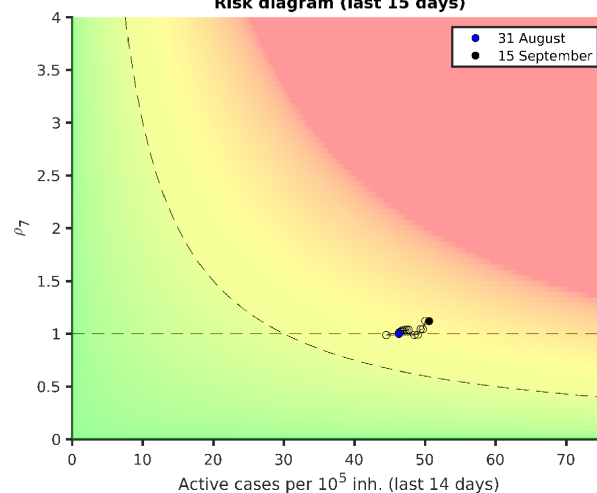
Actual  $\rho_7 = 1.1$



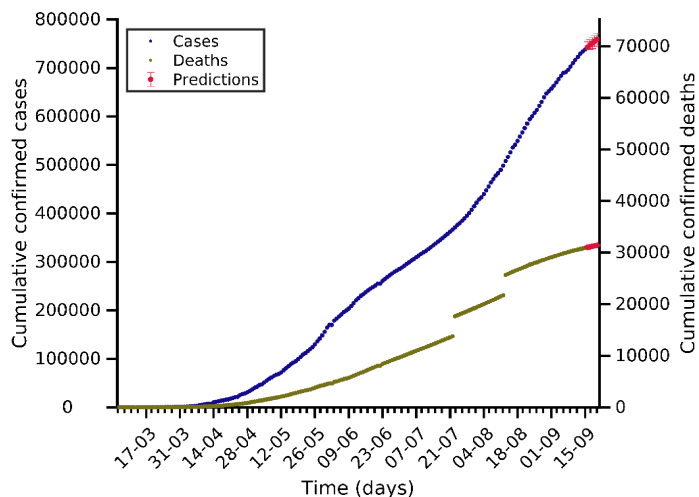
Risk diagram



Risk diagram (last 15 days)



# Peru 15-09-2020. Pop: 33.0M. Cumulative incidence: 2238/10<sup>5</sup>

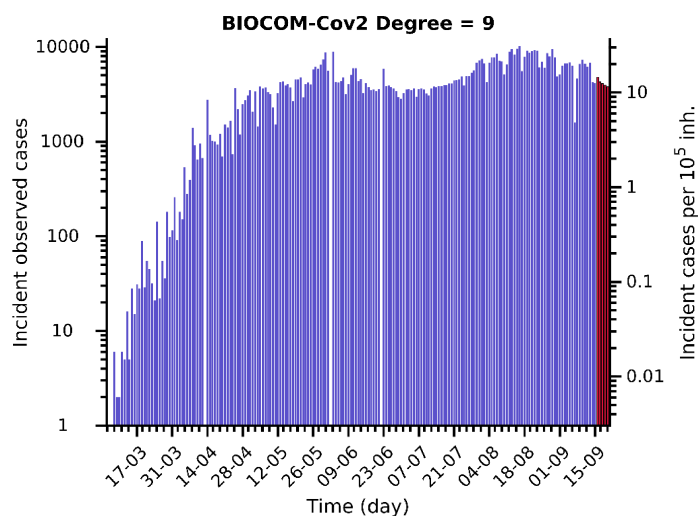
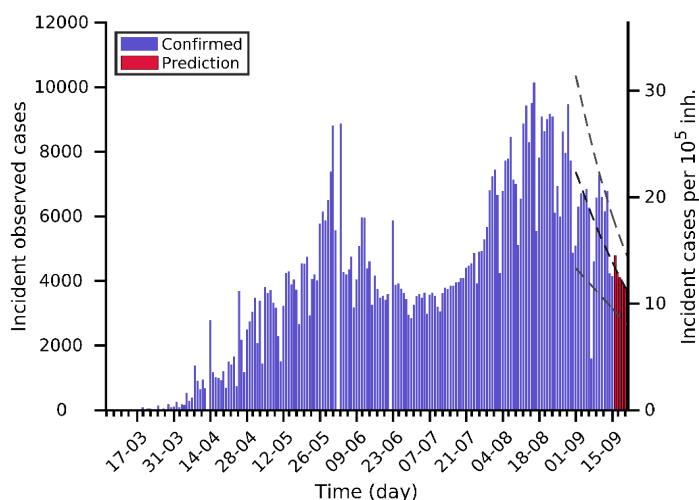


Predictions for next days

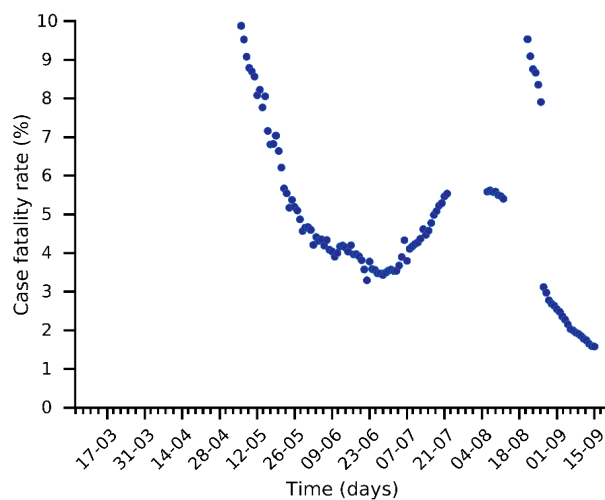
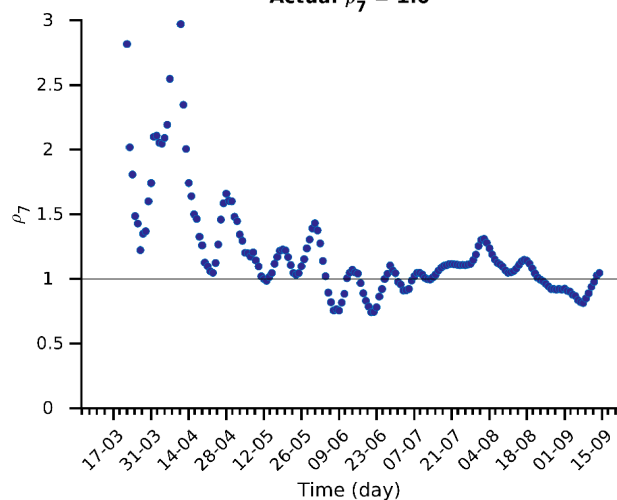
Day	Number of cases	95% Confidence Interval
16-09-2020	742812 (+4792)	[ 738020 - 753754 ]
18-09-2020	751173 (+4103)	[ 739906 - 762441 ]
20-09-2020	758935 (+3808)	[ 747046 - 770825 ]

Current indicators

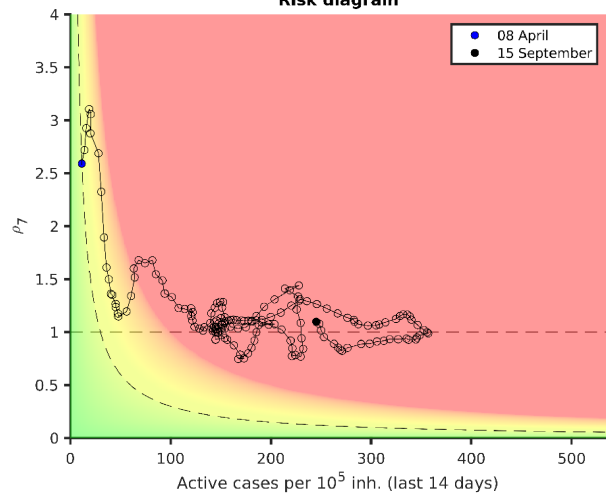
A <sub>14</sub>	EPG	CFR
245	257	1.58 %



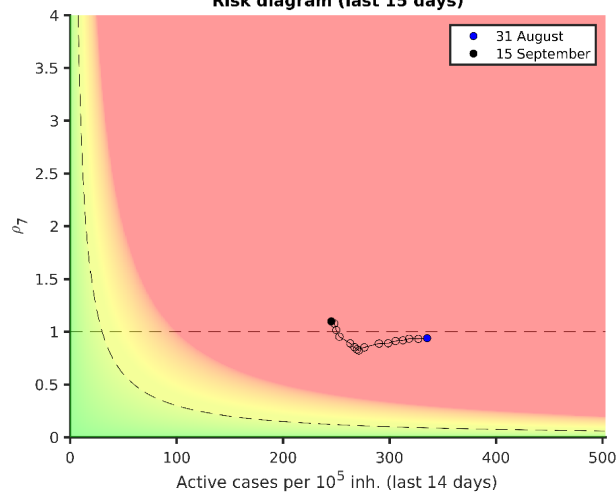
Actual  $\rho_7 = 1.0$



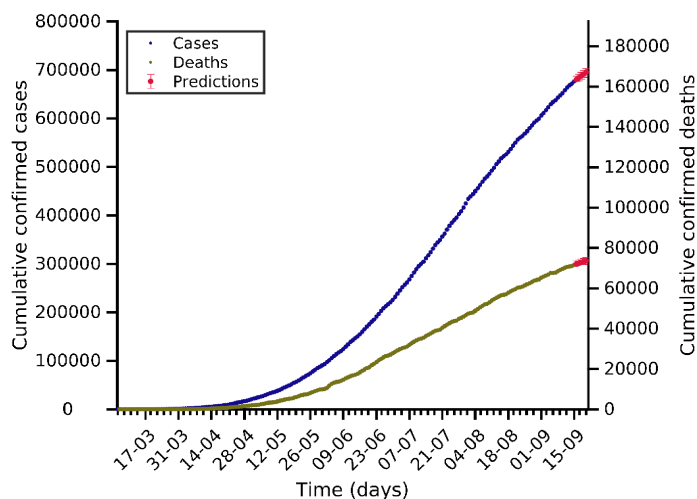
Risk diagram



Risk diagram (last 15 days)



# Mexico 15-09-2020. Pop: 128.9M. Cumulative incidence: 525/10<sup>5</sup>

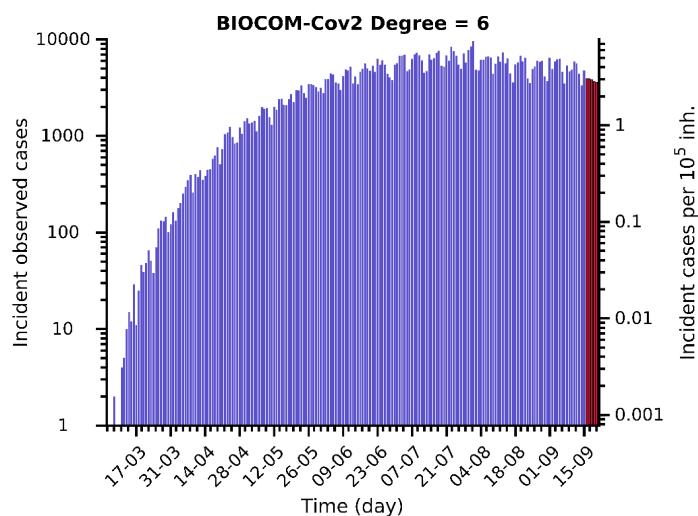
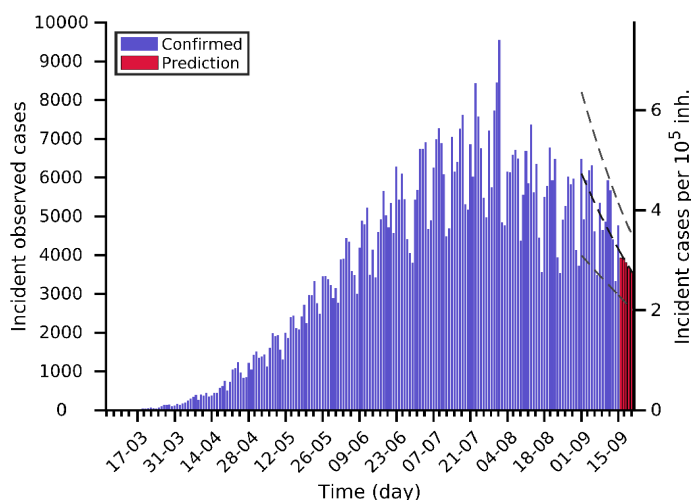


Predictions for next days

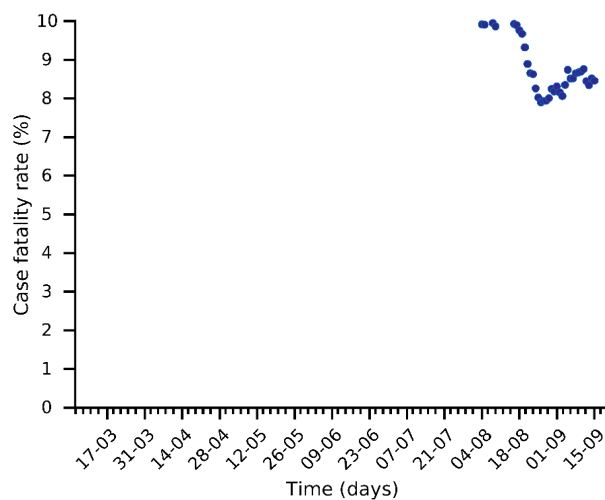
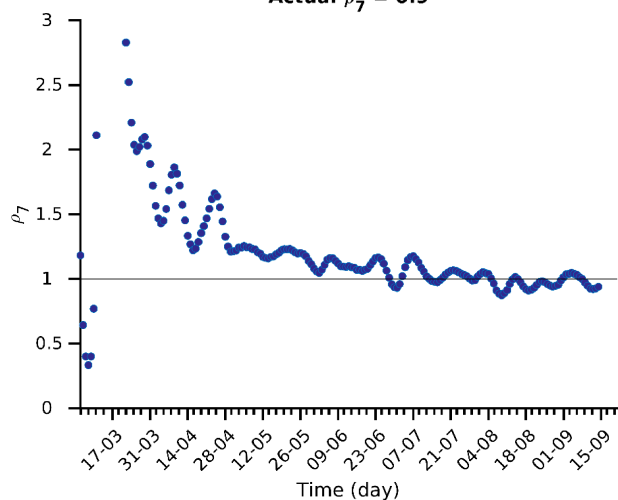
Day	Number of cases	95% Confidence Interval
16-09-2020	680410 (+3923)	[ 676487 - 687168 ]
18-09-2020	688138 (+3807)	[ 681167 - 695109 ]
20-09-2020	695417 (+3585)	[ 688030 - 702804 ]

Current indicators

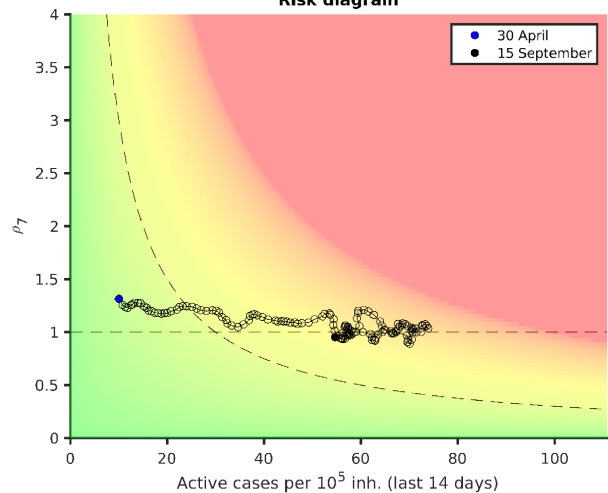
A <sub>14</sub>	EPG	CFR
55	51	8.46 %



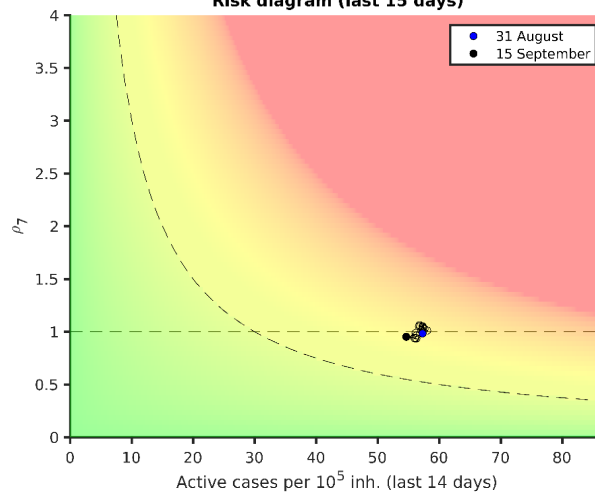
Actual  $\rho_7 = 0.9$



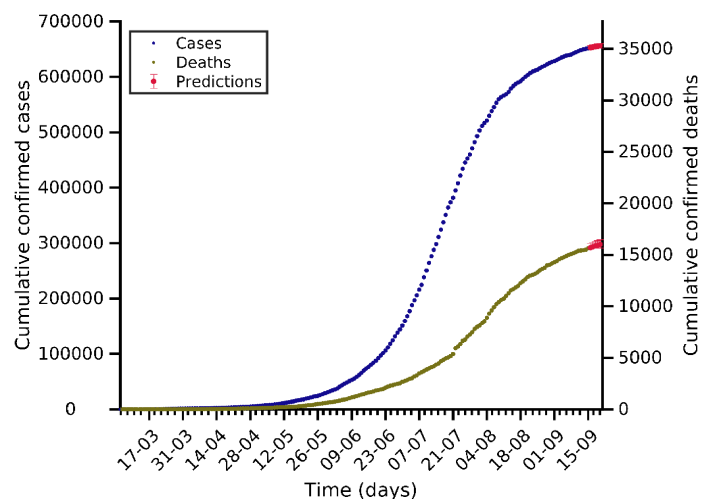
Risk diagram



Risk diagram (last 15 days)



# South Africa 15-09-2020. Pop: 59.3M. Cumulative incidence: 1099/10<sup>5</sup>

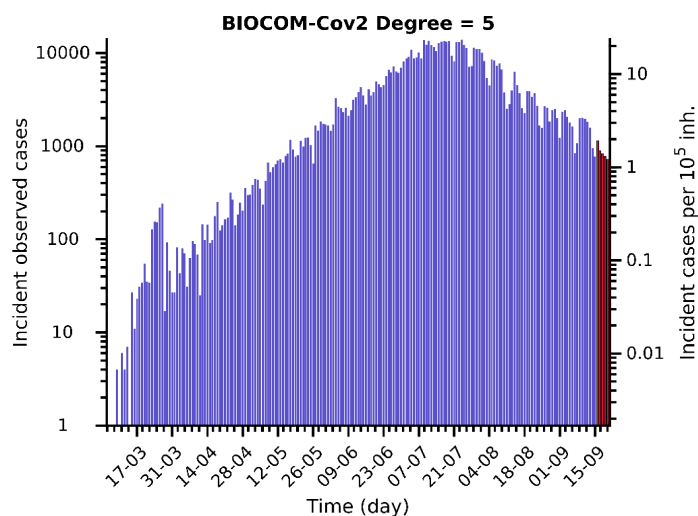
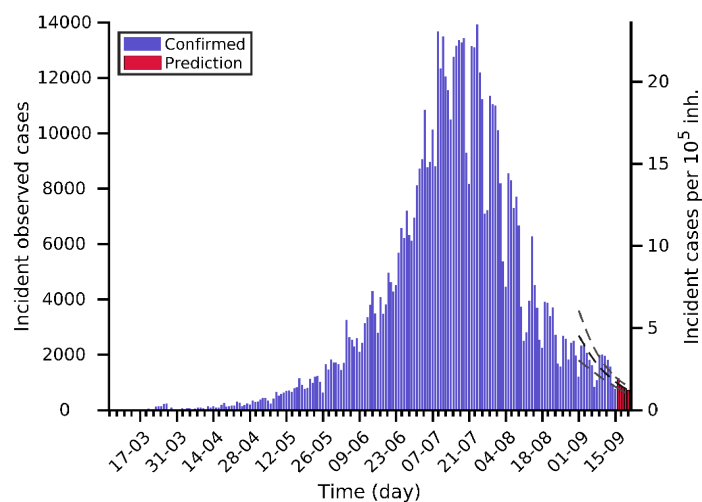


Predictions for next days

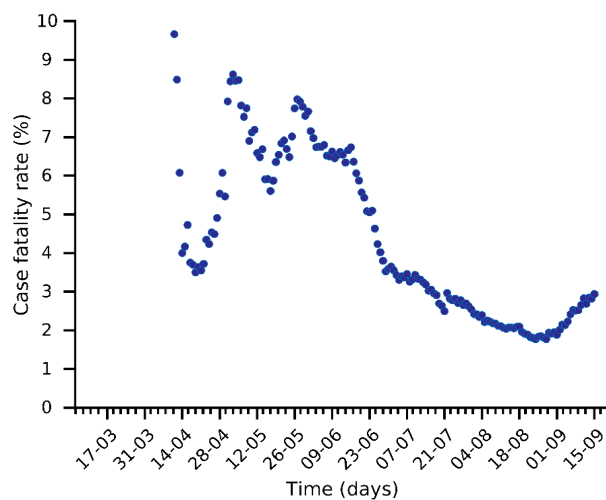
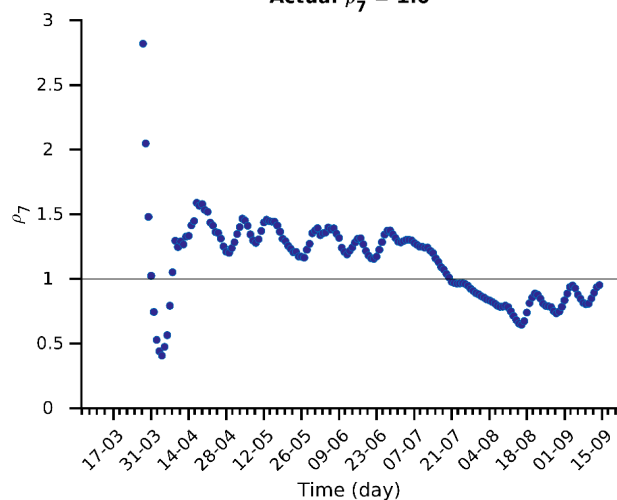
Day	Number of cases	95% Confidence Interval
16-09-2020	652661 (+1140)	[ 651521 - 656769 ]
18-09-2020	654377 (+828)	[ 651521 - 658575 ]
20-09-2020	655866 (+718)	[ 651521 - 660217 ]

Current indicators

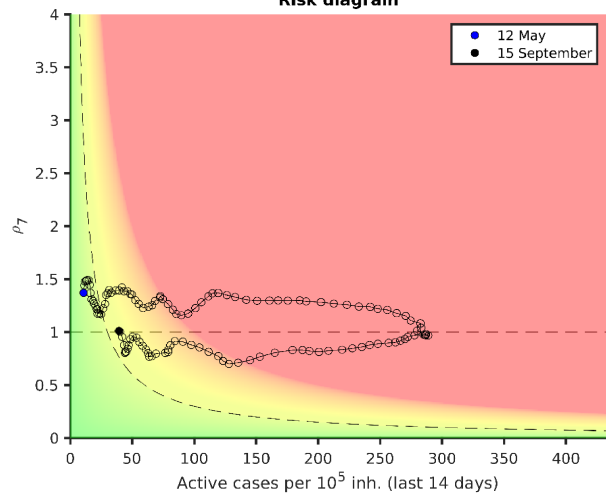
A <sub>14</sub>	EPG	CFR
39	37	2.94 %



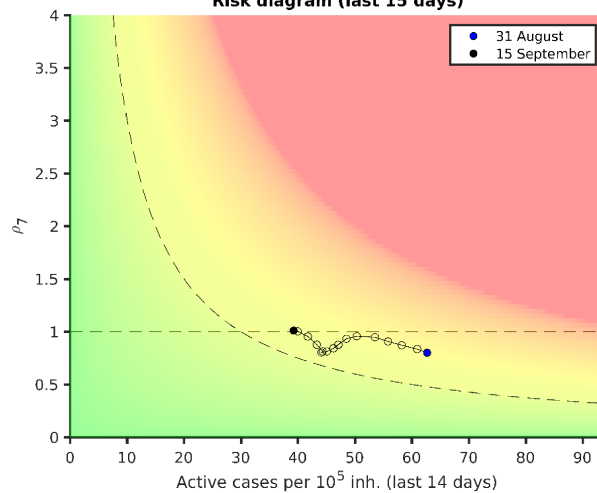
Actual  $\rho_7 = 1.0$



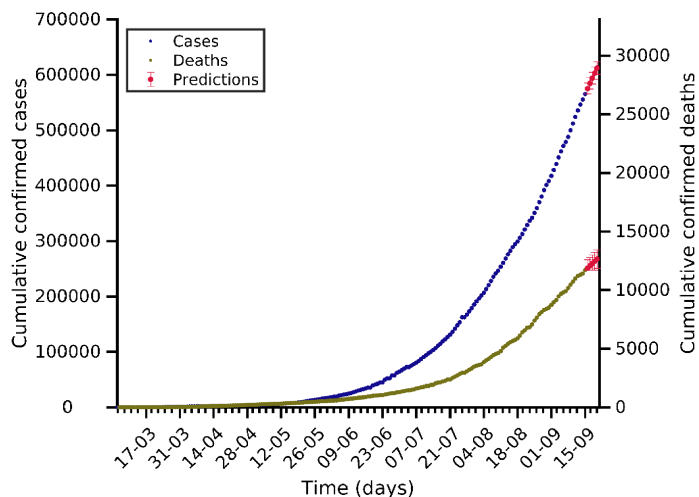
Risk diagram



Risk diagram (last 15 days)



# Argentina 15-09-2020. Pop: 45.2M. Cumulative incidence: 1251/10<sup>5</sup>

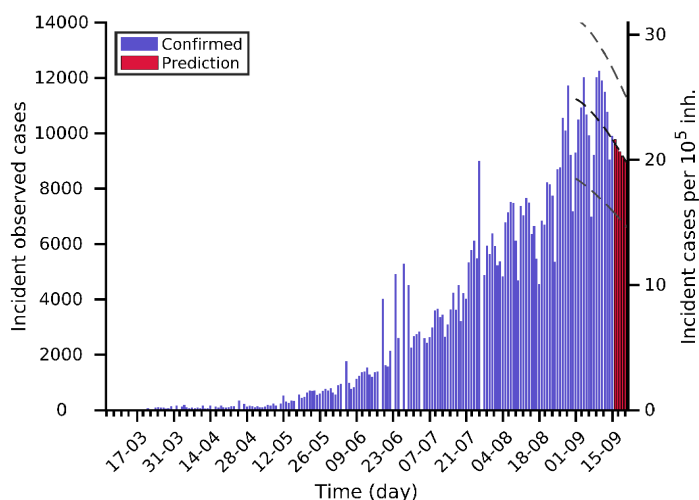


Predictions for next days

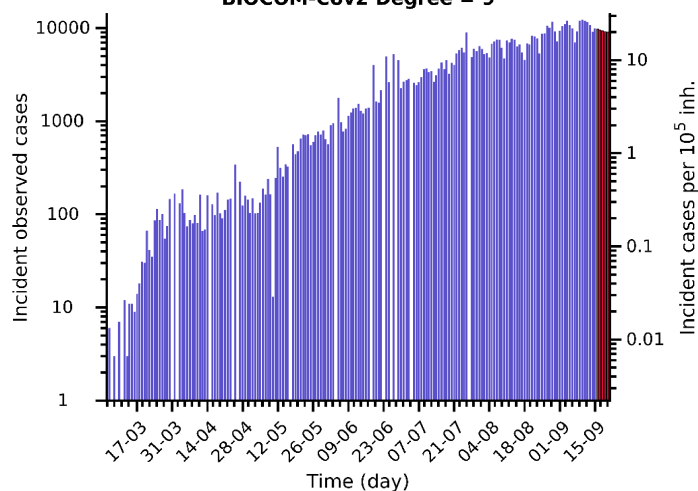
Day	Number of cases	95% Confidence Interval
16-09-2020	575203 (+9771)	[ 565432 - 585403 ]
18-09-2020	594026 (+9336)	[ 583448 - 604603 ]
20-09-2020	612241 (+9031)	[ 600884 - 623599 ]

Current indicators

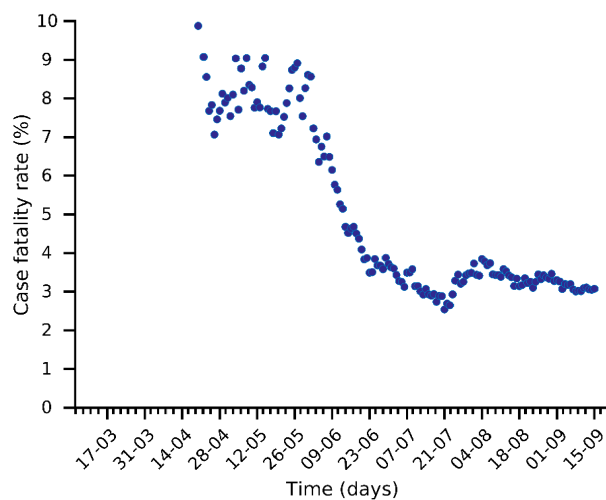
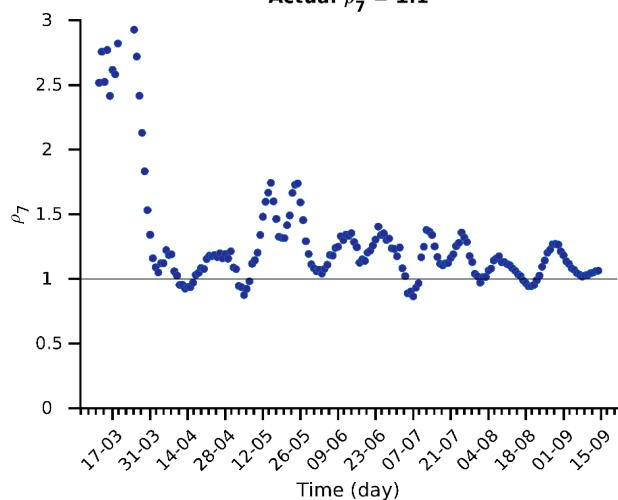
A <sub>14</sub>	EPG	CFR
327	348	3.07 %



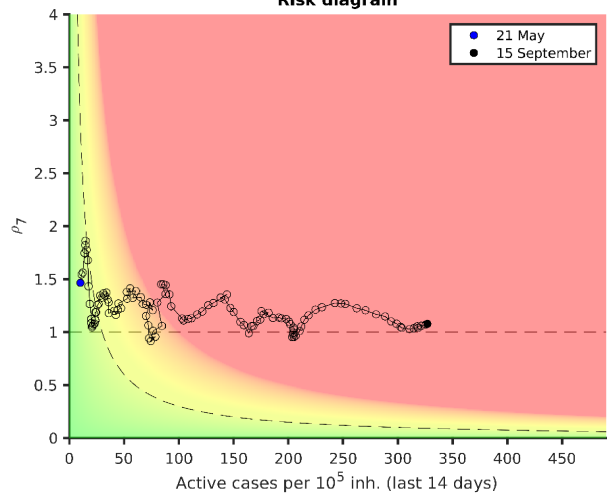
BIOCOM-Cov2 Degree = 9



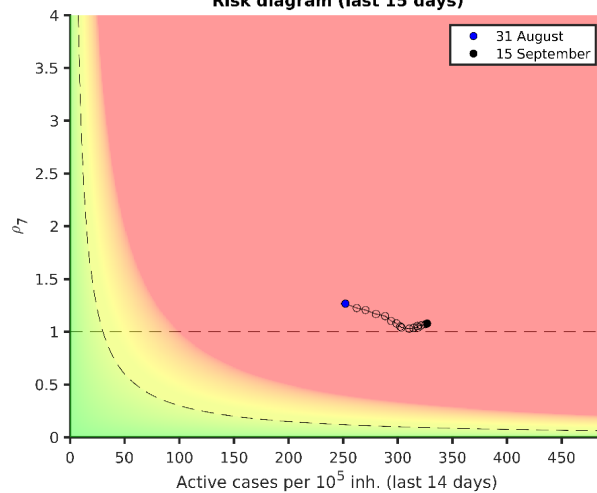
Actual  $\rho_7 = 1.1$



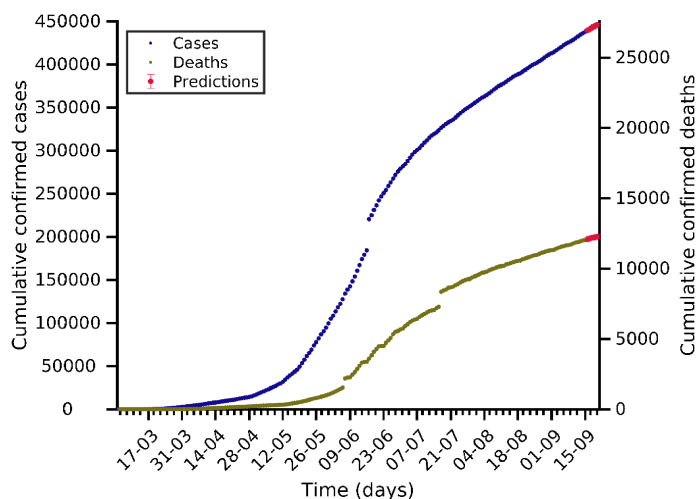
Risk diagram



Risk diagram (last 15 days)



# Chile 15-09-2020. Pop: 19.1M. Cumulative incidence: 2291/10<sup>5</sup>

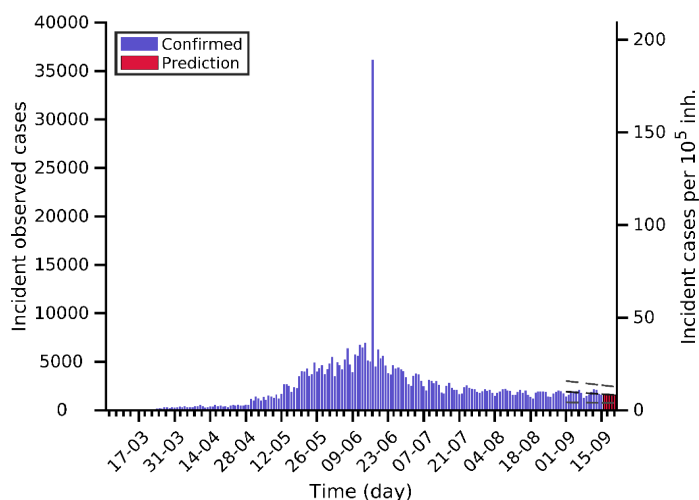


Predictions for next days

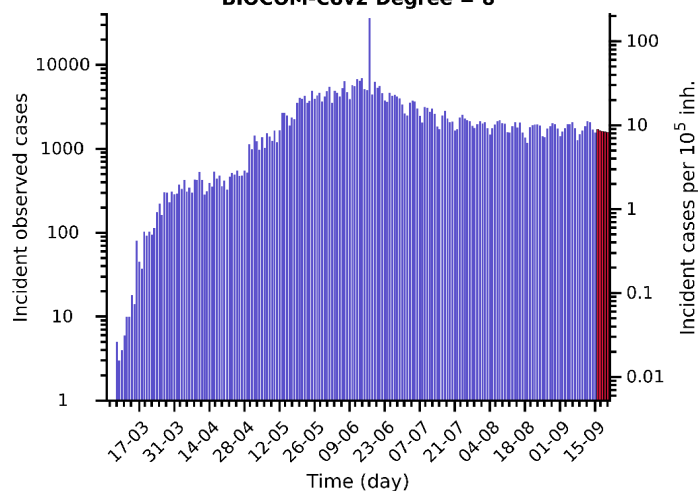
Day	Number of cases	95% Confidence Interval
16-09-2020	439692 (+1709)	[ 438095 - 441289 ]
18-09-2020	442932 (+1611)	[ 441278 - 444586 ]
20-09-2020	446104 (+1577)	[ 444331 - 447877 ]

Current indicators

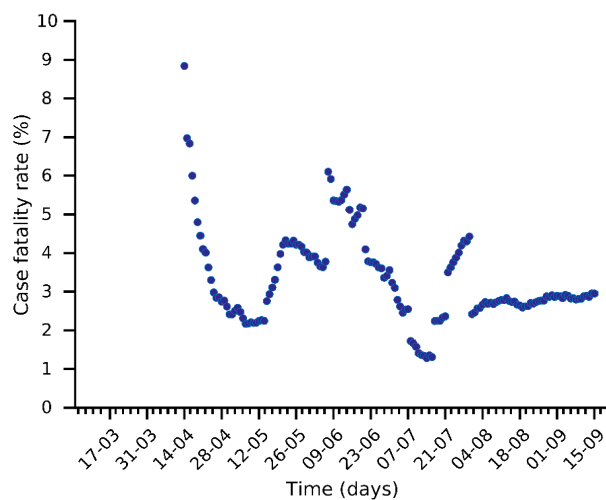
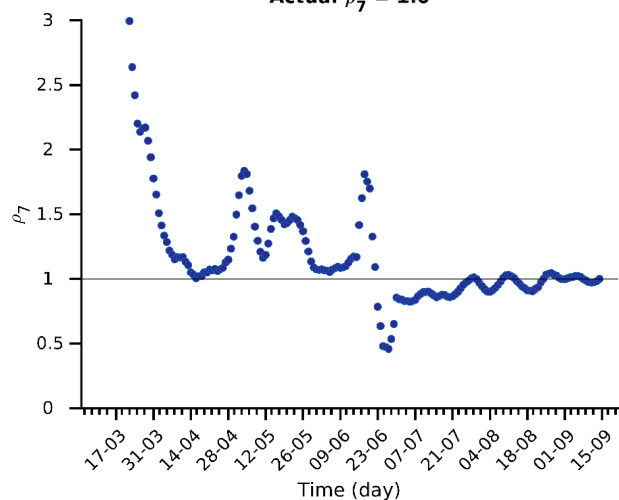
A <sub>14</sub>	EPG	CFR
130	130	2.95 %



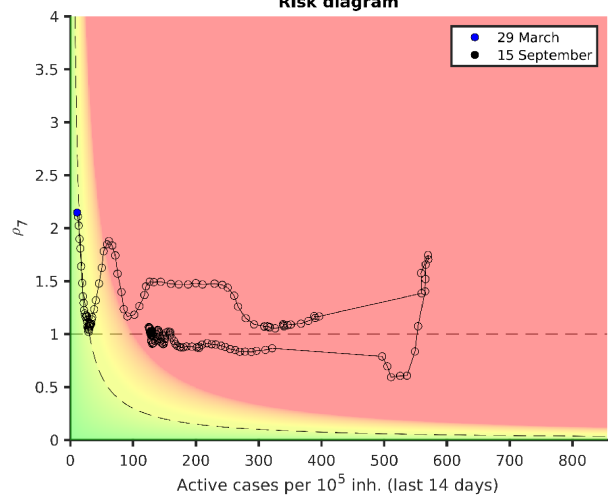
BIOCOM-Cov2 Degree = 8



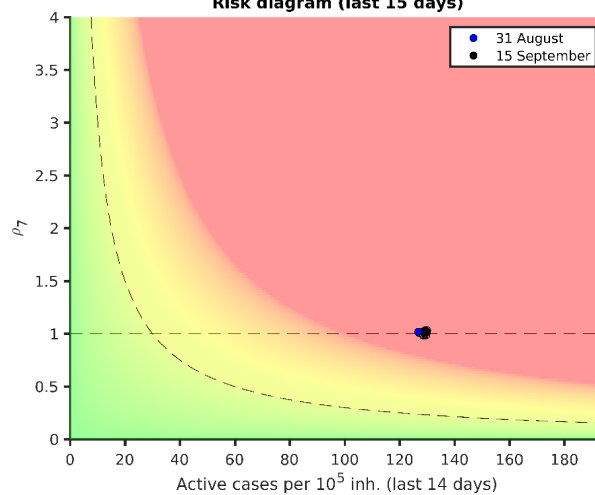
Actual  $\rho_7 = 1.0$



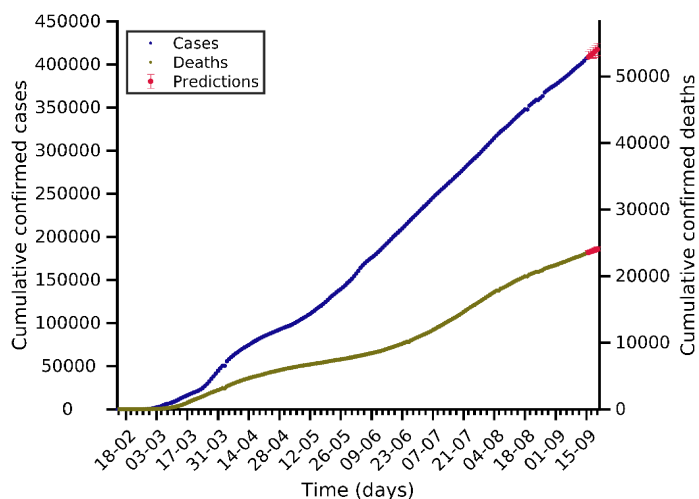
Risk diagram



Risk diagram (last 15 days)



# Iran 15-09-2020. Pop: 84.0M. Cumulative incidence: 485/10<sup>5</sup>

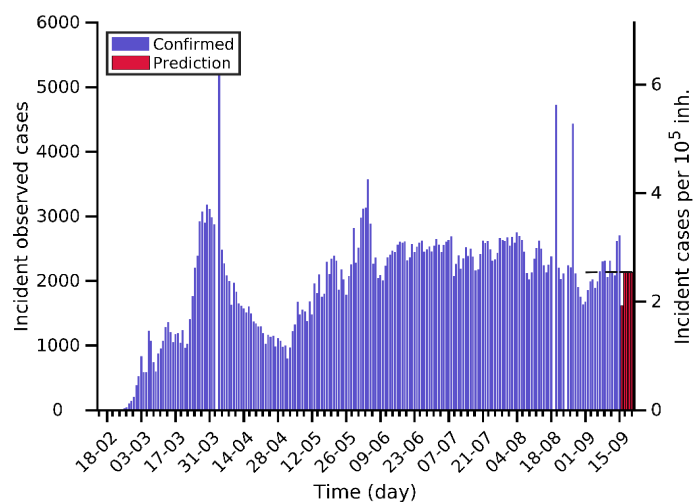


Predictions for next days

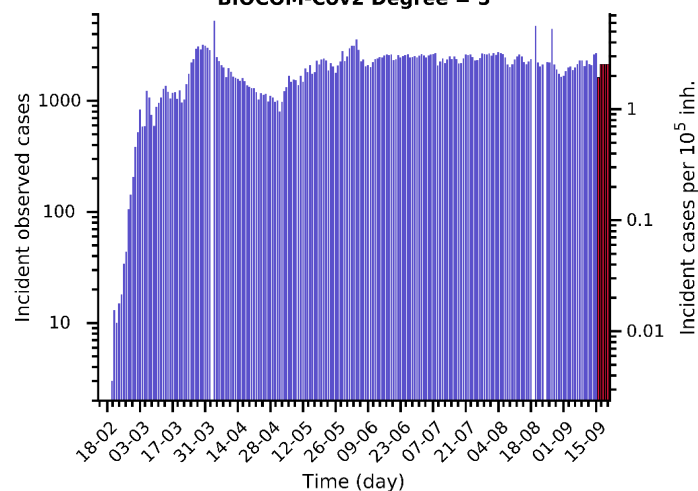
Day	Number of cases	95% Confidence Interval
16-09-2020	408970 (+1617)	[ 407353 - 415473 ]
18-09-2020	413250 (+2140)	[ 407353 - 420008 ]
20-09-2020	417528 (+2139)	[ 410223 - 424833 ]

Current indicators

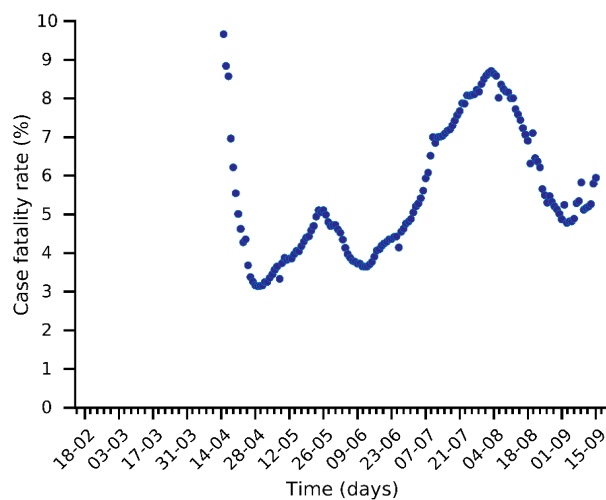
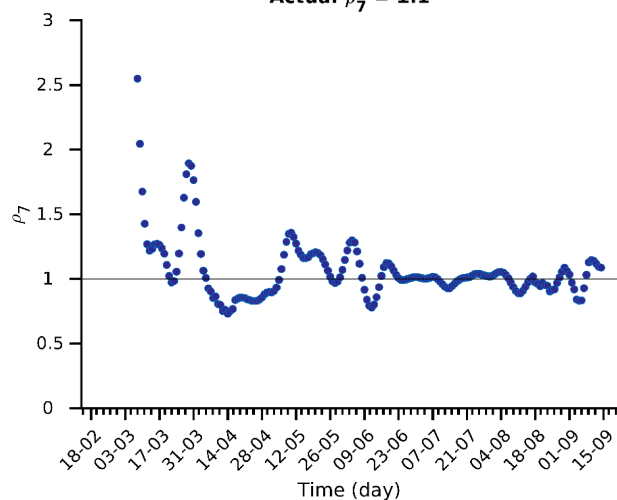
A <sub>14</sub>	EPG	CFR
36	39	5.94 %



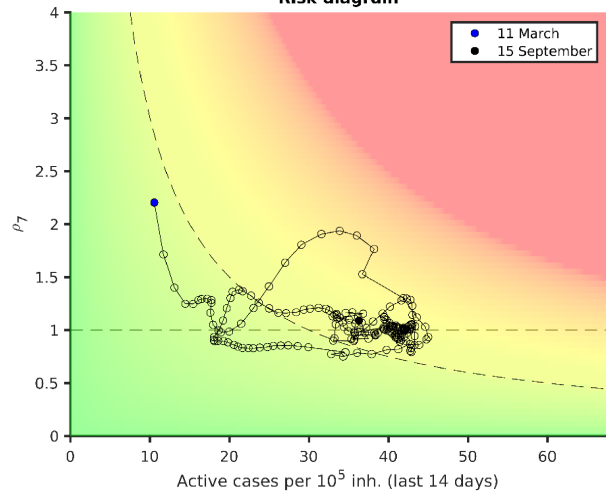
BIOCOM-Cov2 Degree = 5



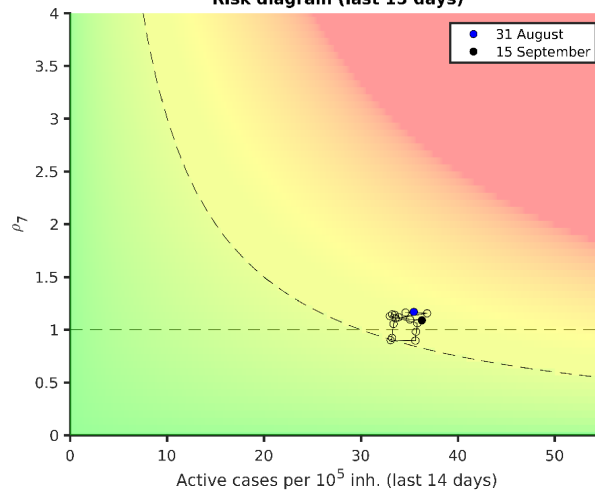
Actual  $\rho_7 = 1.1$



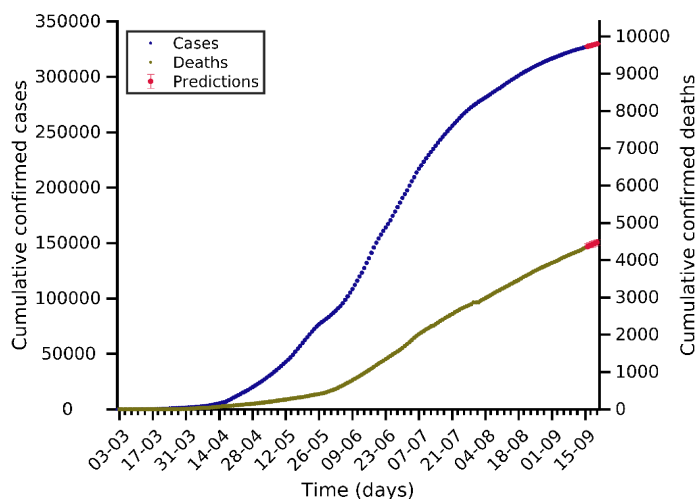
Risk diagram



Risk diagram (last 15 days)



# Saudi Arabia 15-09-2020. Pop: 34.8M. Cumulative incidence: 939/10<sup>5</sup>

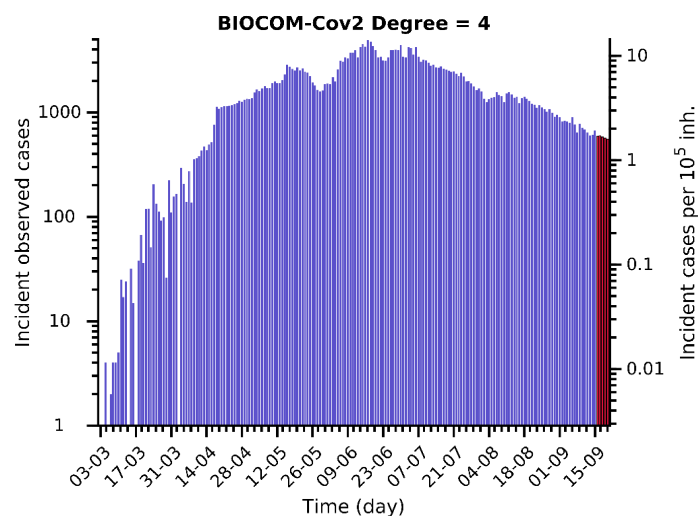
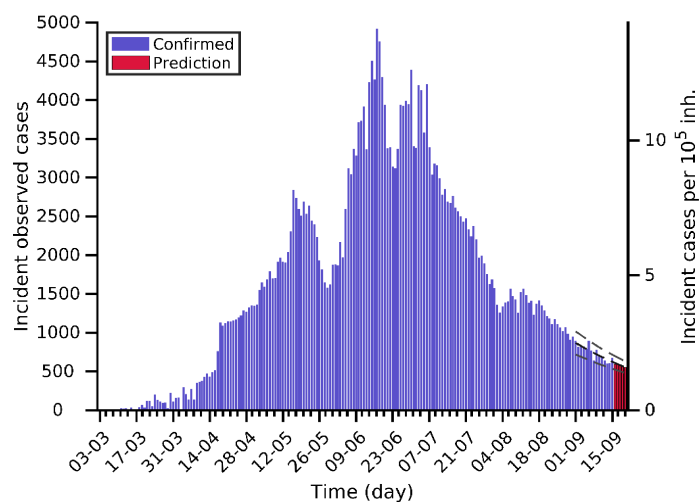


Predictions for next days

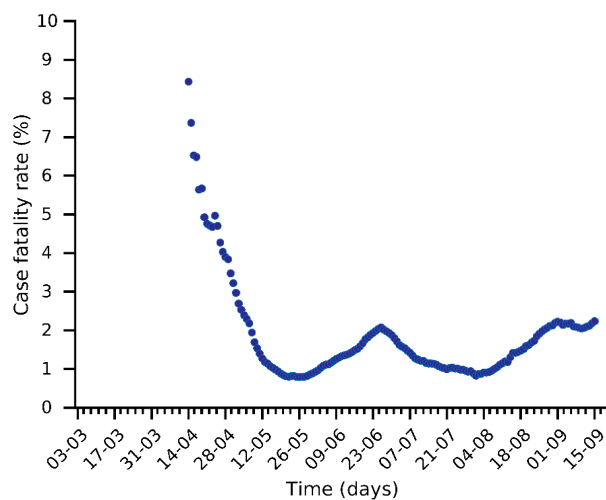
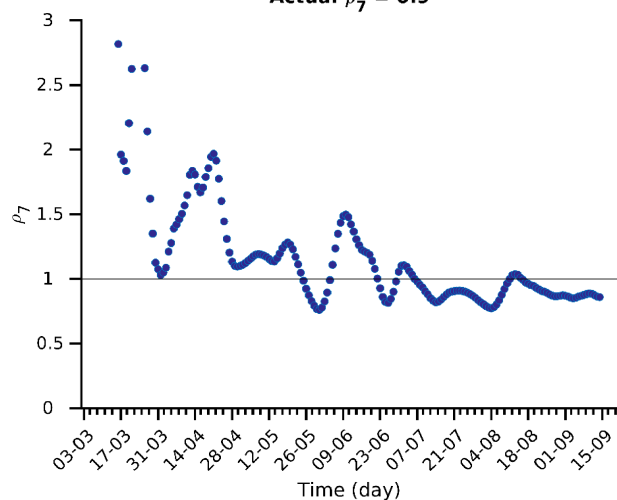
Day	Number of cases	95% Confidence Interval
16-09-2020	327521 (+591)	[ 327170 - 327872 ]
18-09-2020	328698 (+582)	[ 328336 - 329060 ]
20-09-2020	329820 (+554)	[ 329436 - 330205 ]

Current indicators

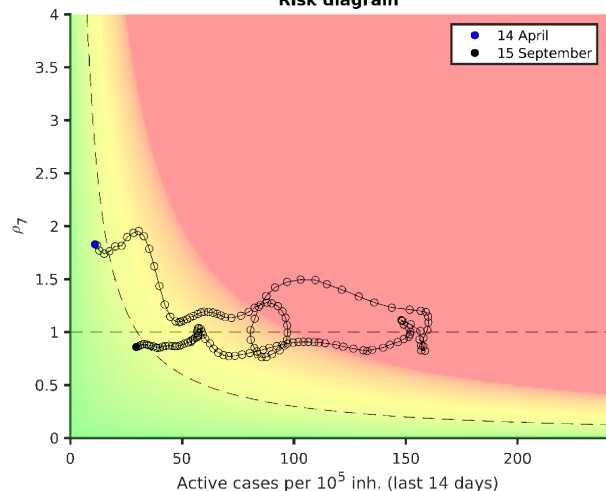
A <sub>14</sub>	EPG	CFR
29	25	2.23 %



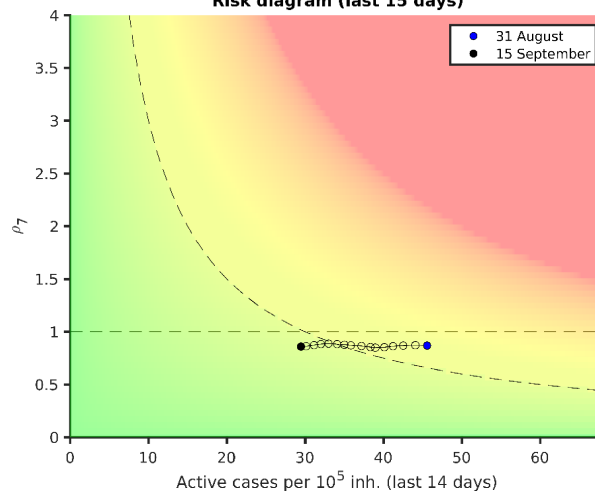
Actual  $\rho_7 = 0.9$



Risk diagram

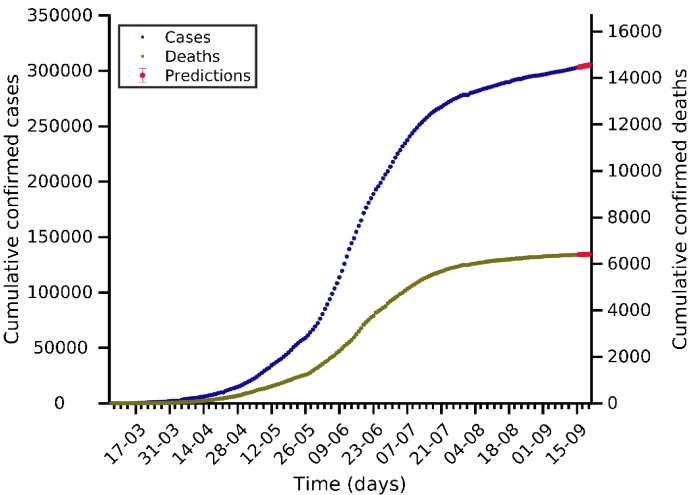


Risk diagram (last 15 days)



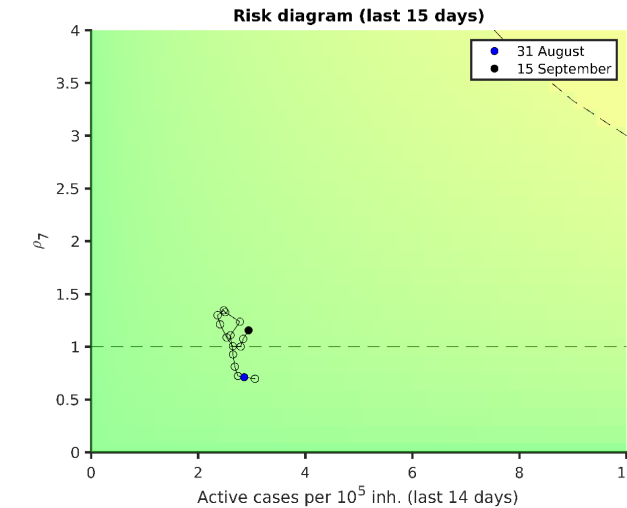
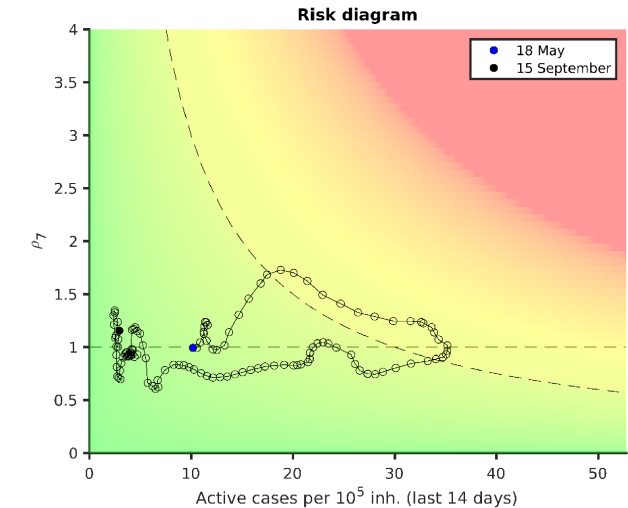
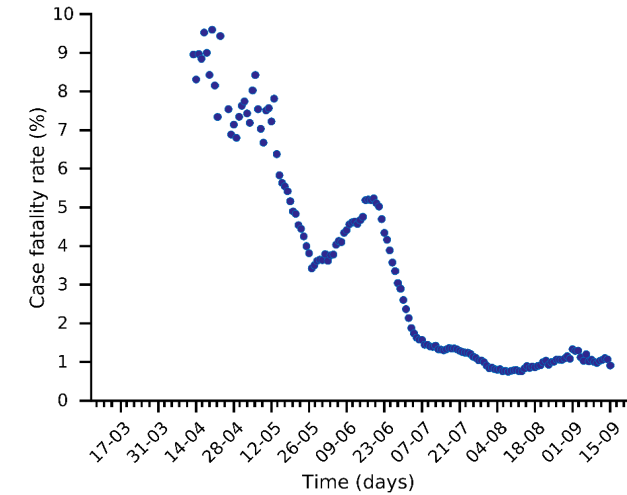
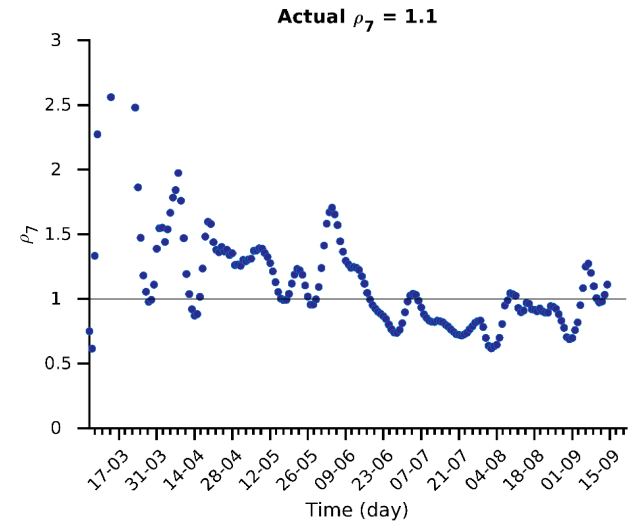
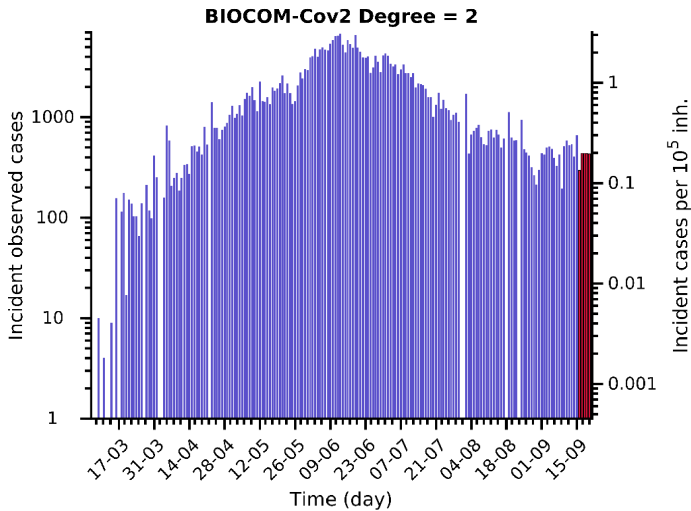
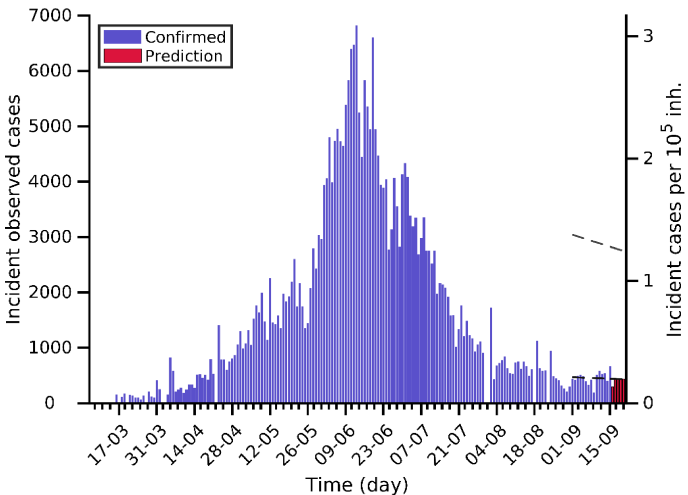


Pakistan 15-09-2020. Pop: 220.9M. Cumulative incidence: 137/10<sup>5</sup>

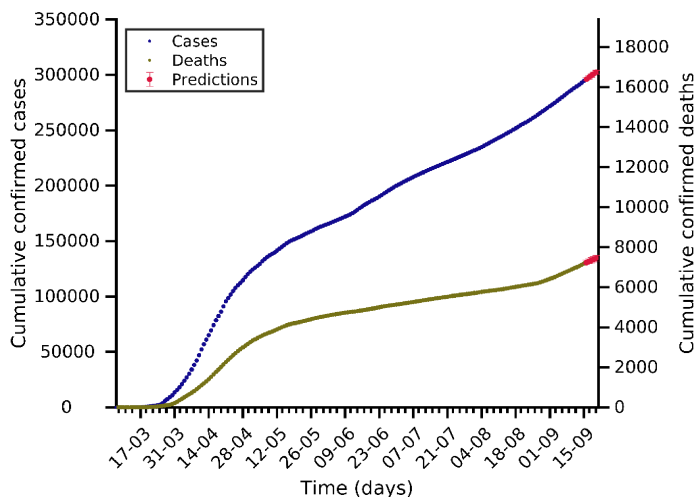


Predictions for next days		
Day	Number of cases	95% Confidence Interval
16-09-2020	303385 (+296)	[ 303089 - 304910 ]
18-09-2020	304259 (+436)	[ 303089 - 305841 ]
20-09-2020	305126 (+433)	[ 303424 - 306828 ]

Current indicators		
A <sub>14</sub>	EPG	CFR
3	3	0.91 %



# Turkey 15-09-2020. Pop: 84.3M. Cumulative incidence: 349/10<sup>5</sup>

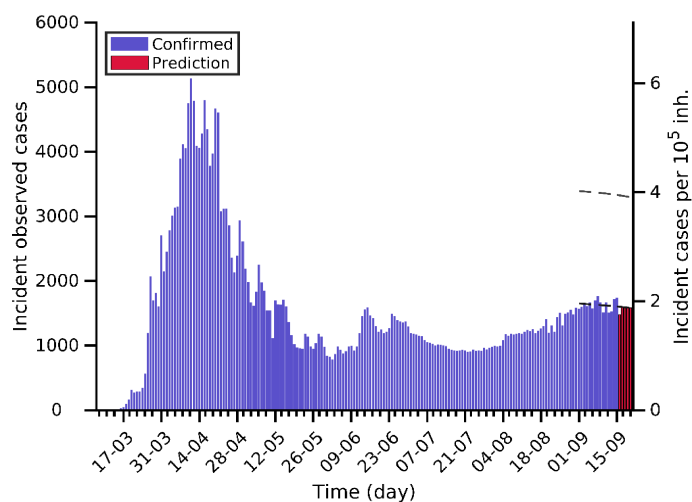


Predictions for next days

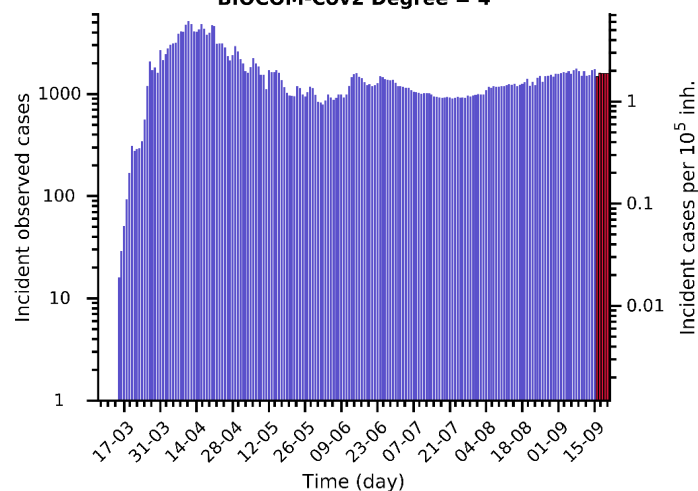
Day	Number of cases	95% Confidence Interval
16-09-2020	296096 (+1476)	[ 294620 - 297576 ]
18-09-2020	299287 (+1593)	[ 297750 - 300824 ]
20-09-2020	302461 (+1585)	[ 300803 - 304119 ]

Current indicators

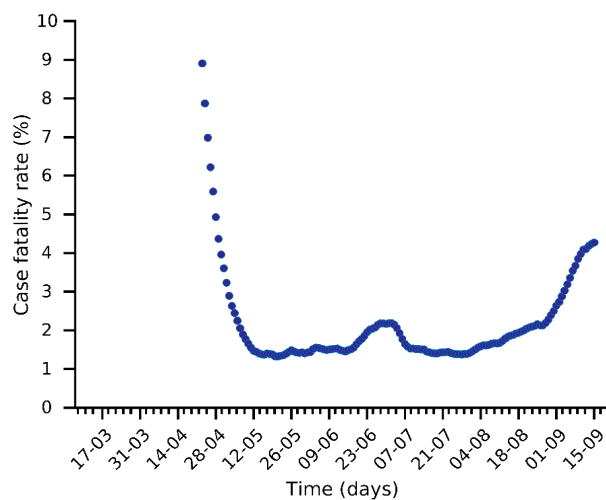
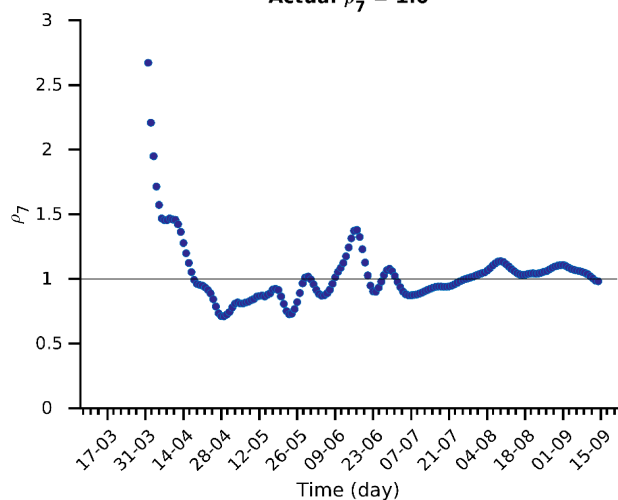
A <sub>14</sub>	EPG	CFR
27	27	4.27 %



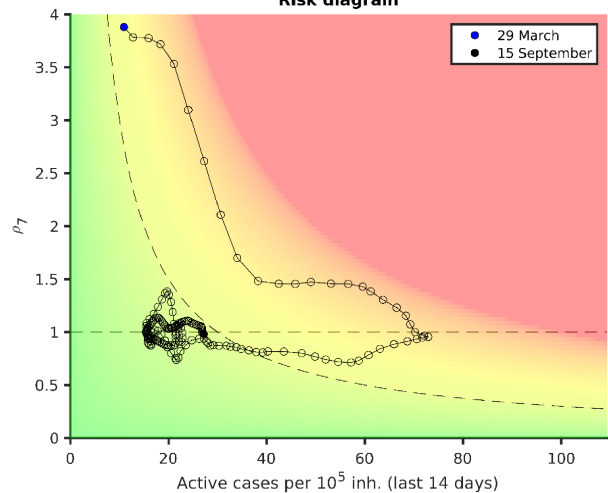
BIOCOM-Cov2 Degree = 4



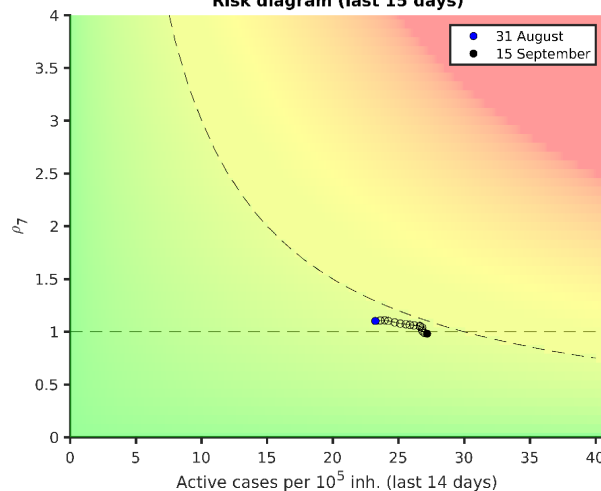
Actual  $\rho_7 = 1.0$



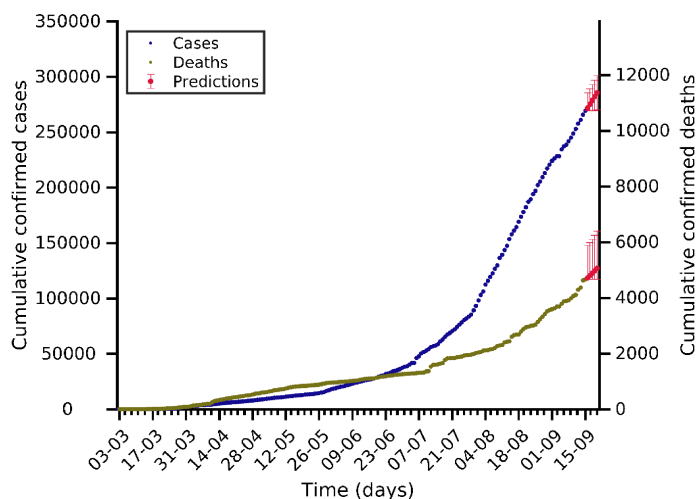
Risk diagram



Risk diagram (last 15 days)



# Philippines 15-09-2020. Pop: 109.6M. Cumulative incidence: 246/10<sup>5</sup>

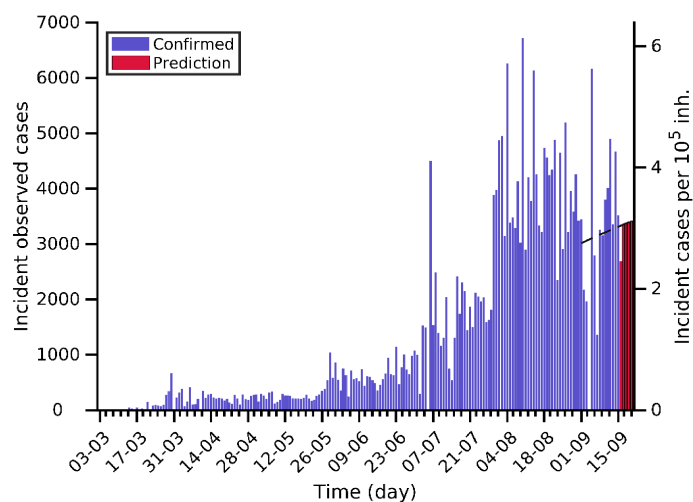


Predictions for next days

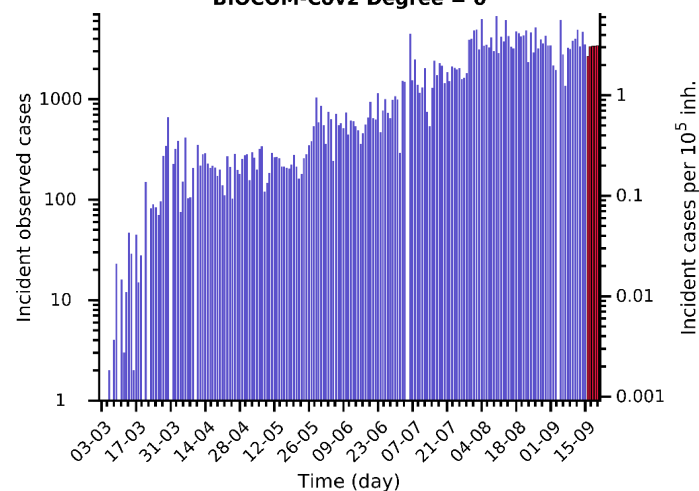
Day	Number of cases	95% Confidence Interval
16-09-2020	272090 (+2683)	[ 269407 - 285667 ]
18-09-2020	278816 (+3373)	[ 269407 - 292968 ]
20-09-2020	285621 (+3412)	[ 270206 - 301037 ]

Current indicators

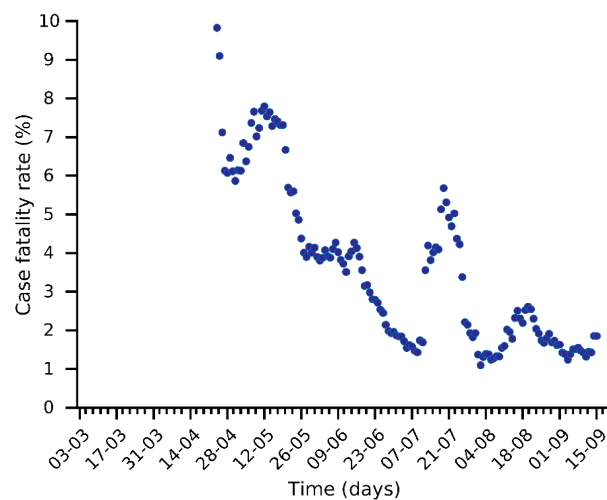
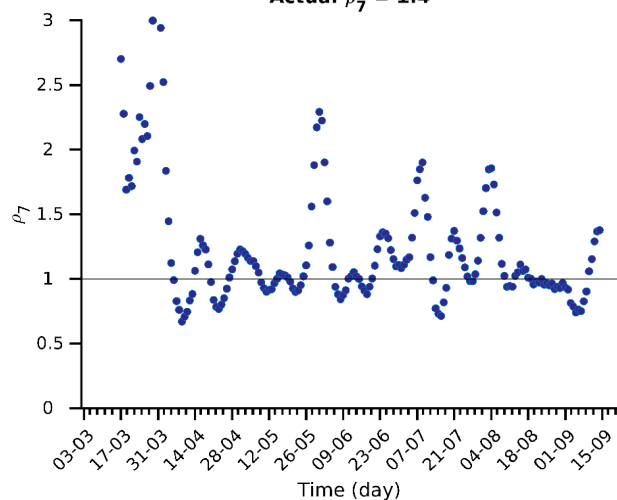
A <sub>14</sub>	EPG	CFR
41	57	1.85 %



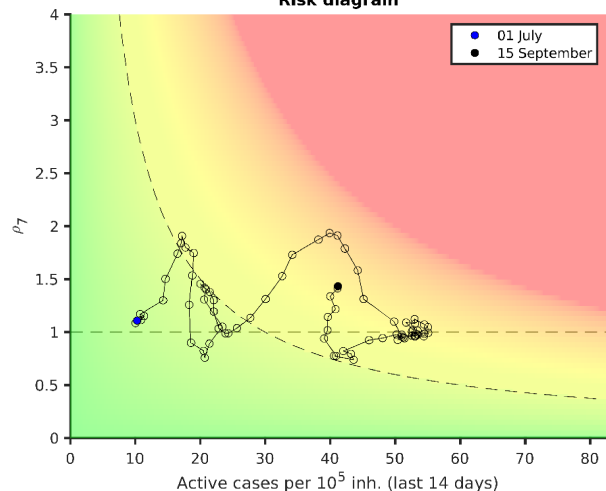
BIOCOM-Cov2 Degree = 6



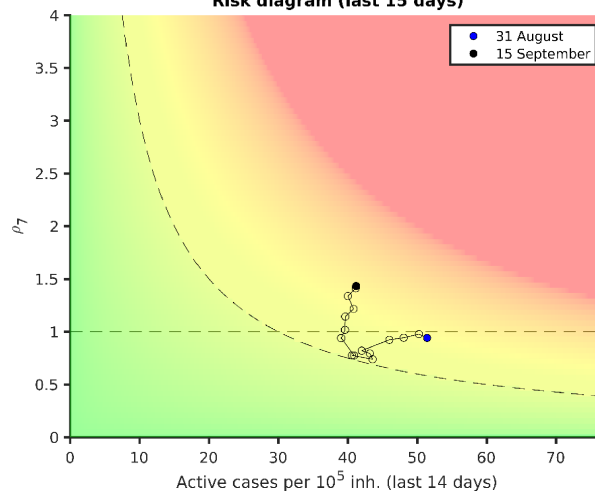
Actual  $\rho_7 = 1.4$



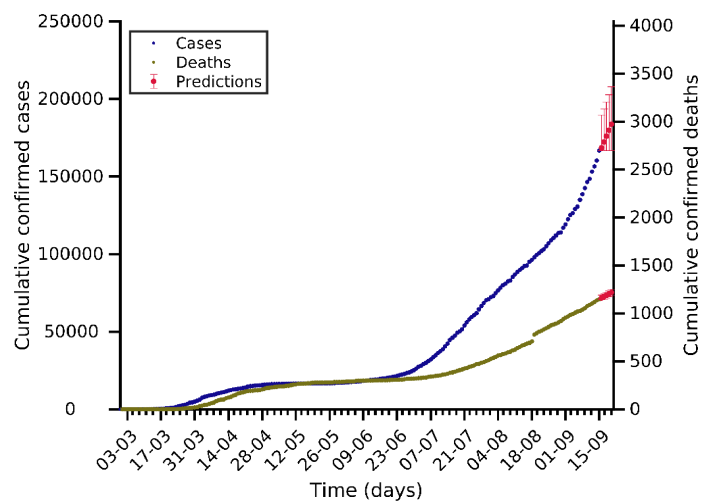
Risk diagram



Risk diagram (last 15 days)



# Israel 15-09-2020. Pop: 8.7M. Cumulative incidence: 1927/10<sup>5</sup>

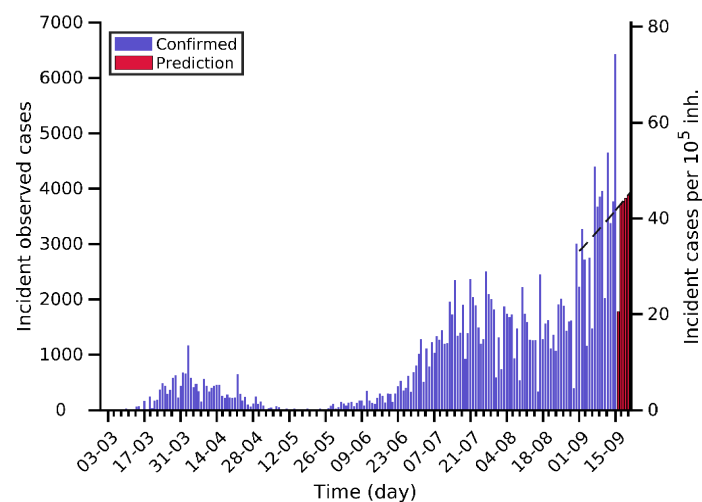


Predictions for next days

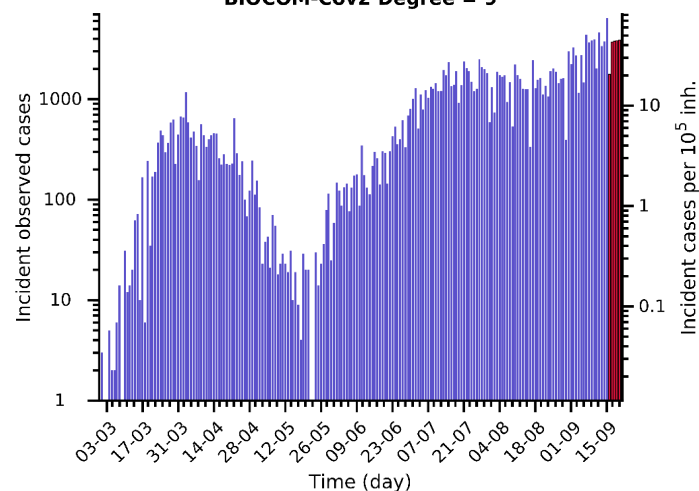
Day	Number of cases	95% Confidence Interval
16-09-2020	168572 (+1778)	[ 166794 - 189564 ]
18-09-2020	176065 (+3775)	[ 166794 - 198041 ]
20-09-2020	183782 (+3887)	[ 166794 - 208010 ]

Current indicators

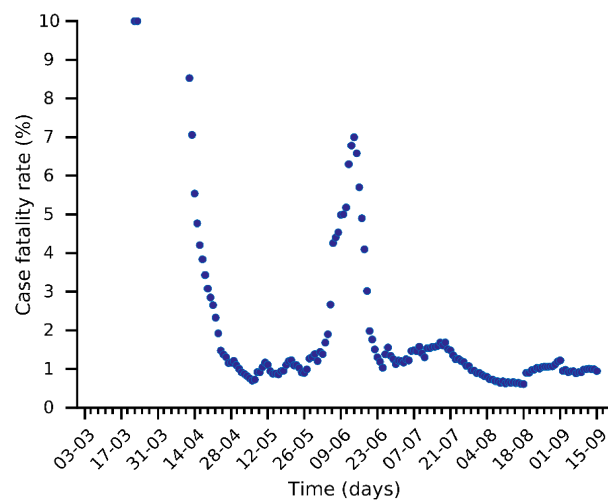
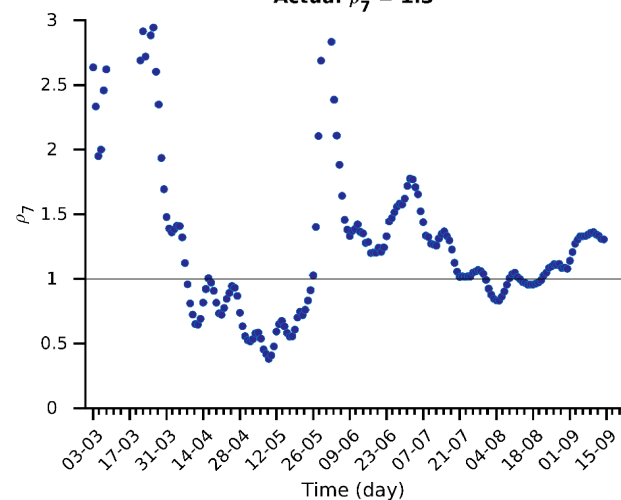
A <sub>14</sub>	EPG	CFR
549	717	0.94 %



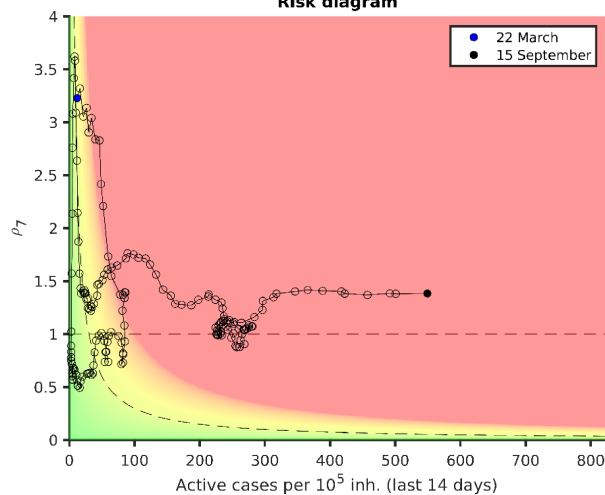
BIOCOM-Cov2 Degree = 9



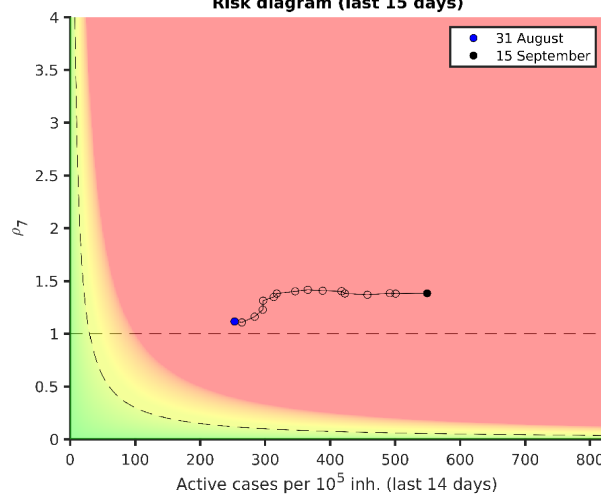
Actual  $\rho_7 = 1.3$



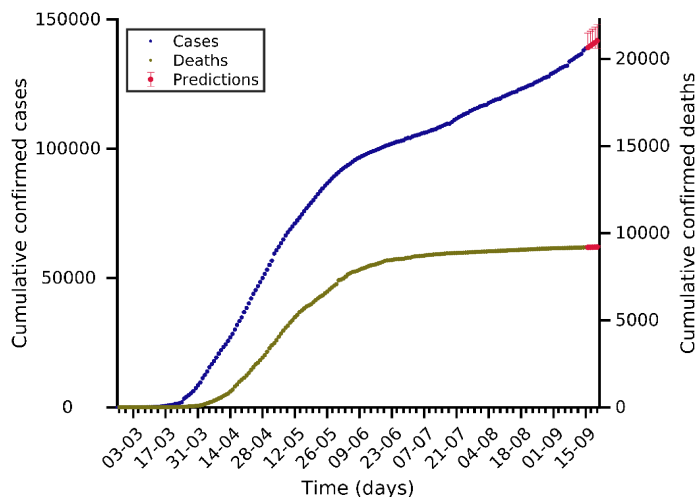
Risk diagram



Risk diagram (last 15 days)



# Canada 15-09-2020. Pop: 37.7M. Cumulative incidence: 368/10<sup>5</sup>

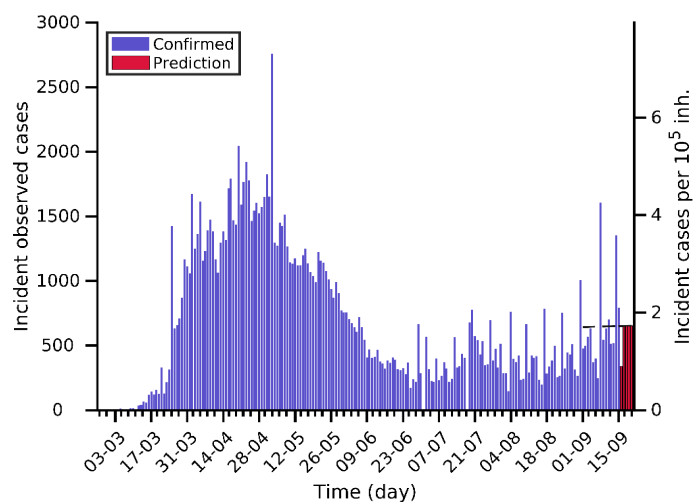


Predictions for next days

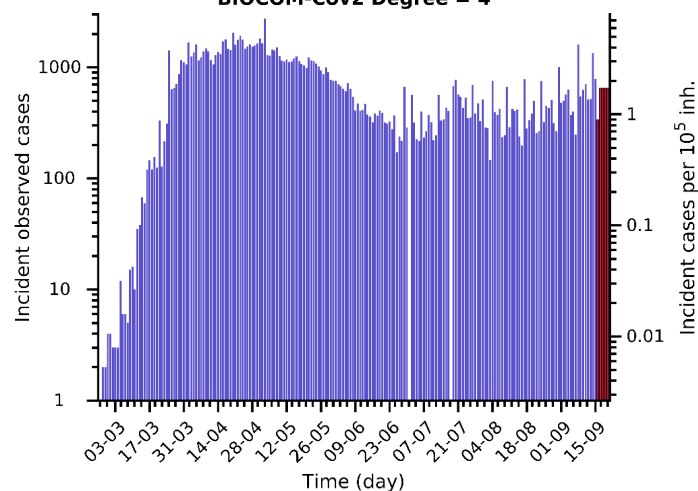
Day	Number of cases	95% Confidence Interval
16-09-2020	139141 (+338)	[ 138803 - 144711 ]
18-09-2020	140446 (+653)	[ 138803 - 146236 ]
20-09-2020	141754 (+654)	[ 138803 - 148014 ]

Current indicators

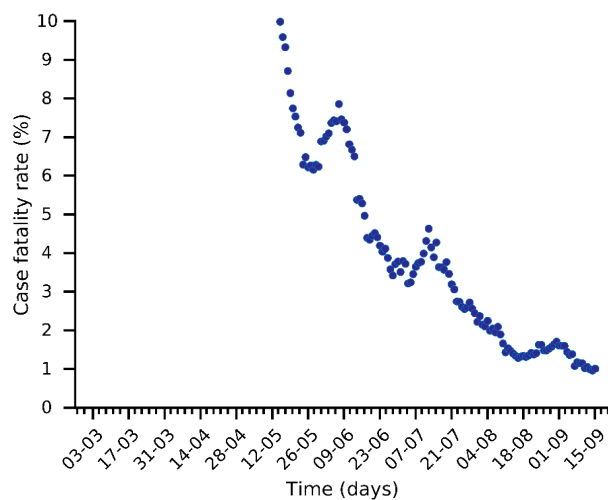
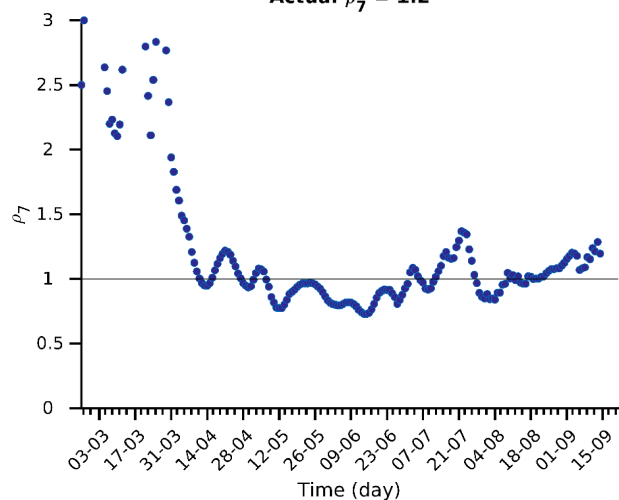
A <sub>14</sub>	EPG	CFR
25	30	1.01 %



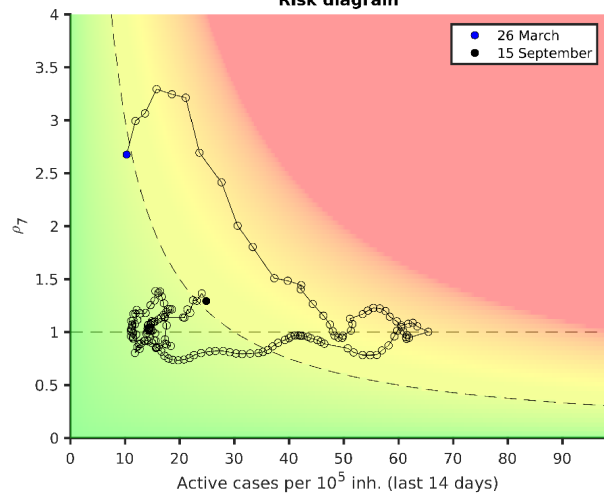
BIOCOM-Cov2 Degree = 4



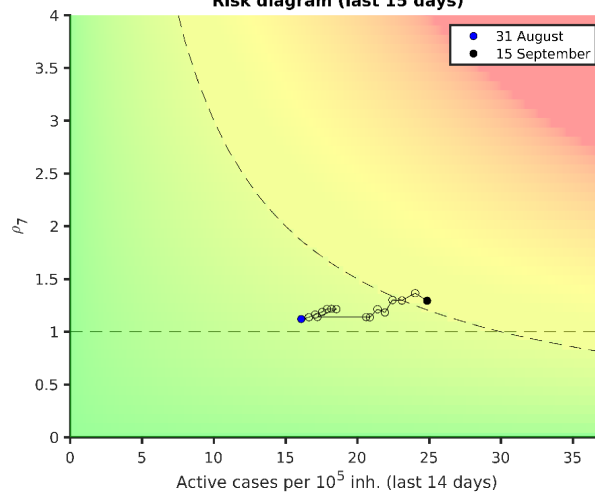
Actual  $\rho_7 = 1.2$



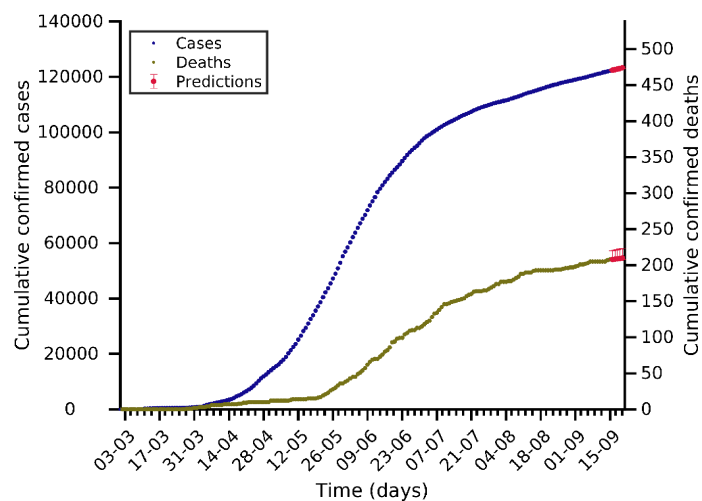
Risk diagram



Risk diagram (last 15 days)



# Qatar 15-09-2020. Pop: 2.9M. Cumulative incidence: 4242/10<sup>5</sup>

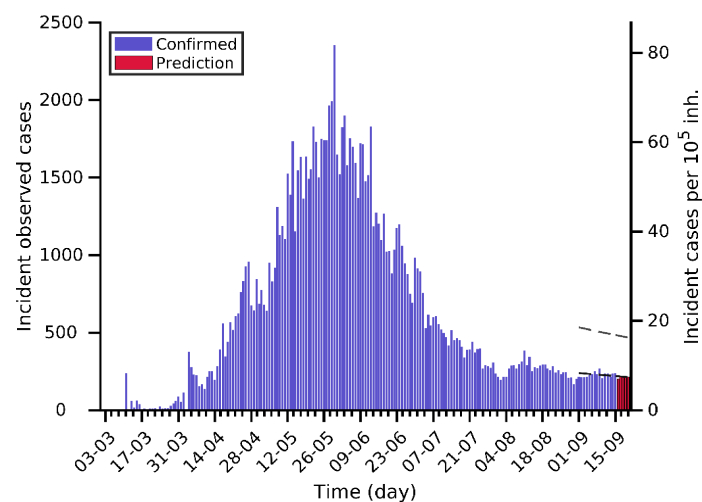


Predictions for next days

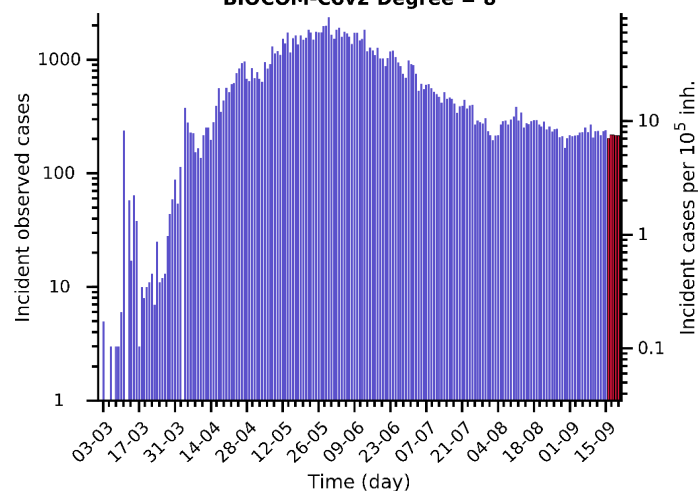
Day	Number of cases	95% Confidence Interval
16-09-2020	122416 (+202)	[ 122214 - 122648 ]
18-09-2020	122851 (+217)	[ 122611 - 123091 ]
20-09-2020	123280 (+214)	[ 123022 - 123539 ]

Current indicators

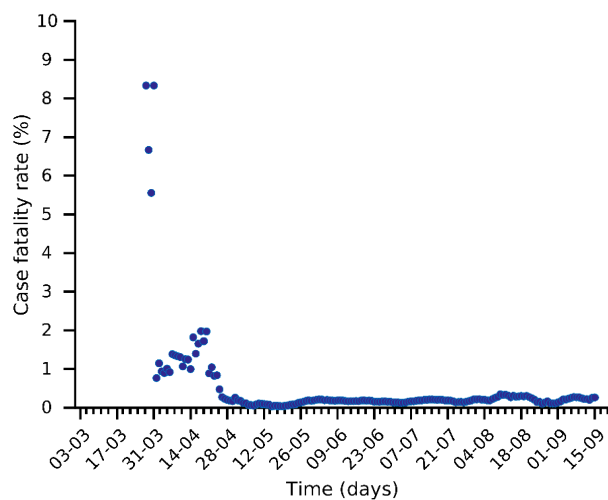
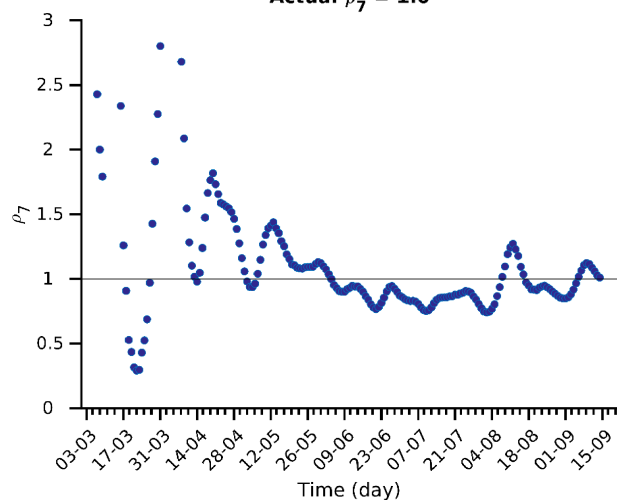
A <sub>14</sub>	EPG	CFR
112	113	0.26 %



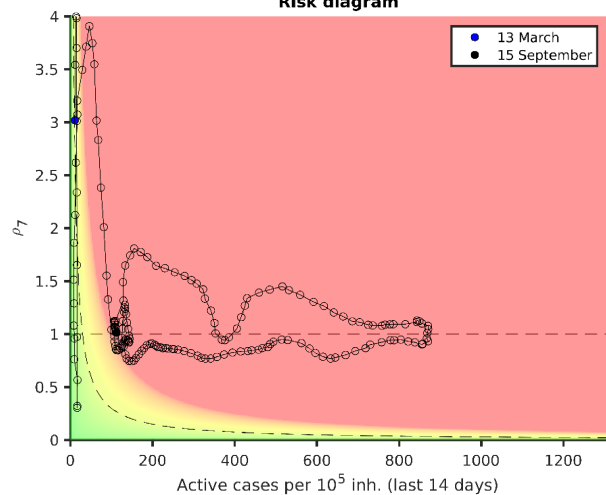
BIOCOM-Cov2 Degree = 8



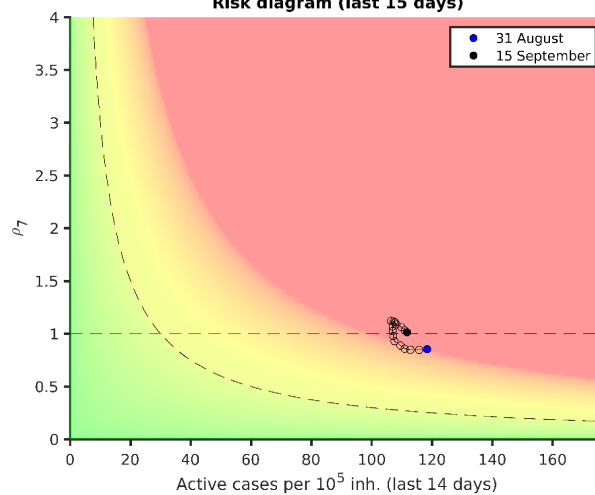
Actual  $\rho_7 = 1.0$



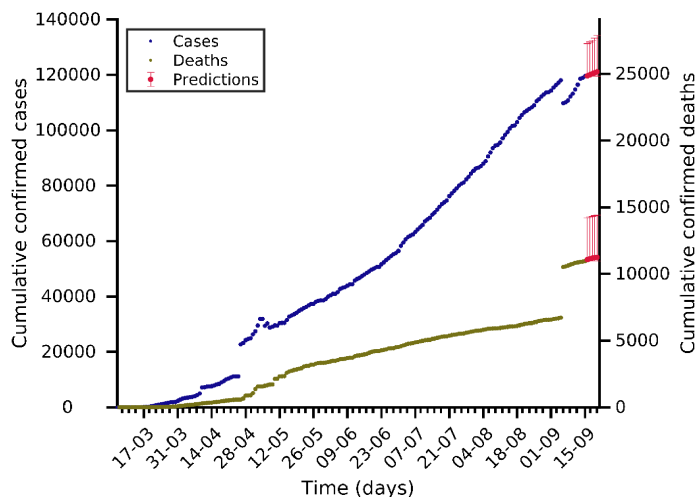
Risk diagram



Risk diagram (last 15 days)



# Ecuador 15-09-2020. Pop: 17.6M. Cumulative incidence: 678/10<sup>5</sup>

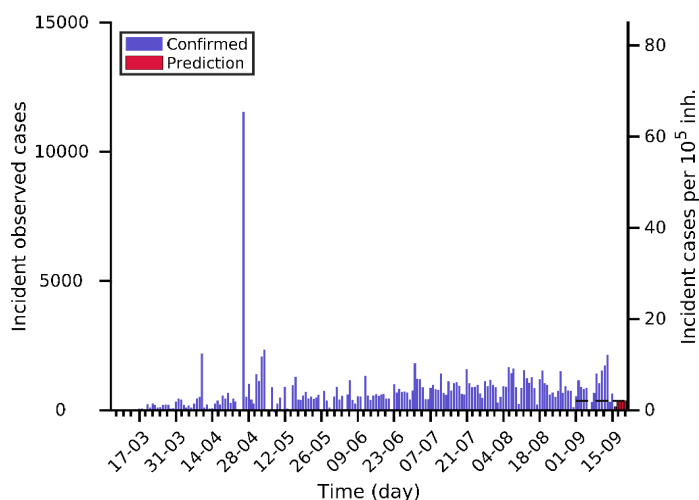


Predictions for next days

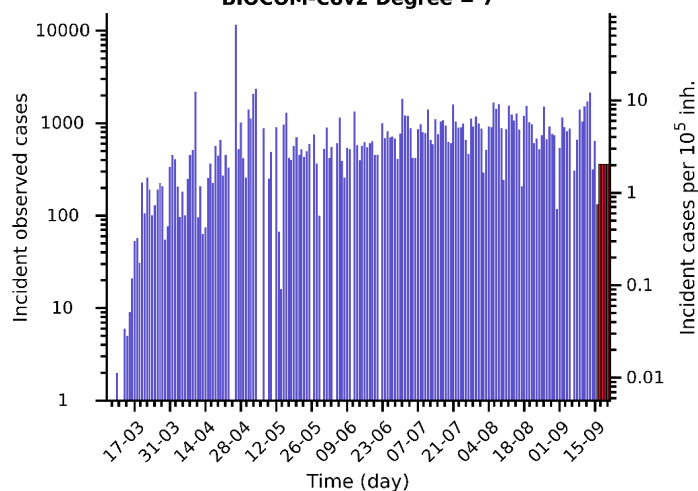
Day	Number of cases	95% Confidence Interval
16-09-2020	119685 (+132)	[ 119553 - 131341 ]
18-09-2020	120406 (+361)	[ 119553 - 132518 ]
20-09-2020	121127 (+361)	[ 119553 - 134216 ]

Current indicators

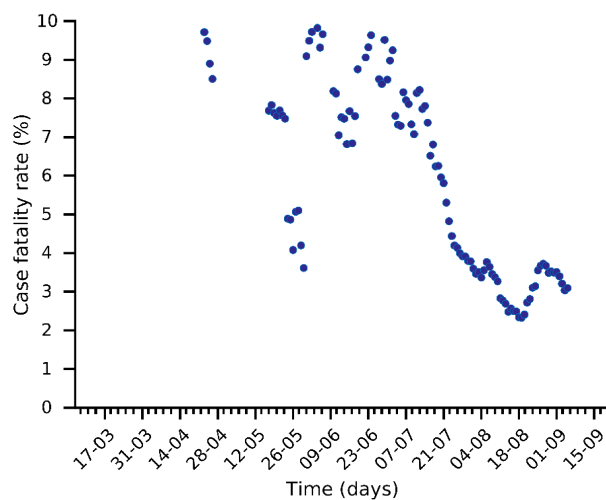
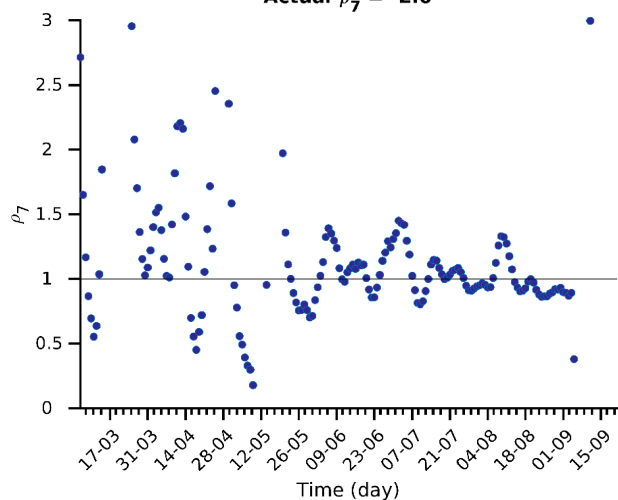
A <sub>14</sub>	EPG	CFR
30	-79	10.00 %



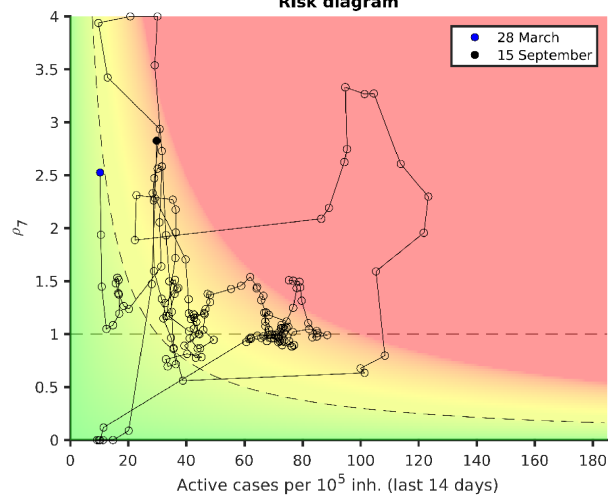
BIOCOM-Cov2 Degree = 7



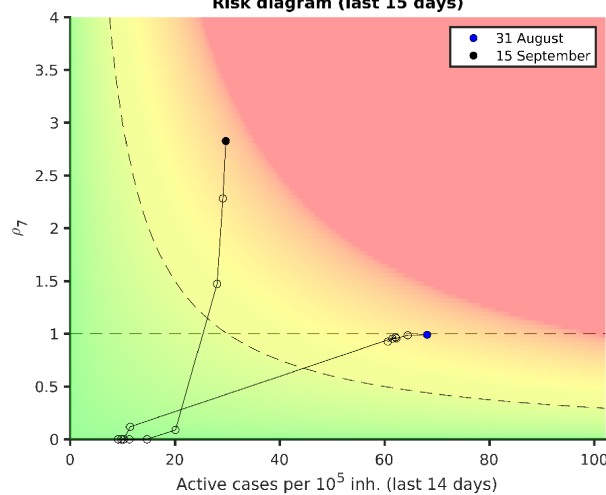
Actual  $\rho_7 = -2.6$



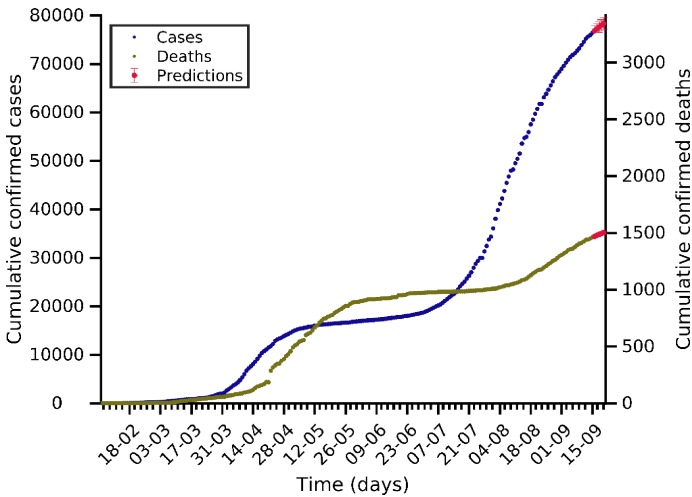
Risk diagram



Risk diagram (last 15 days)

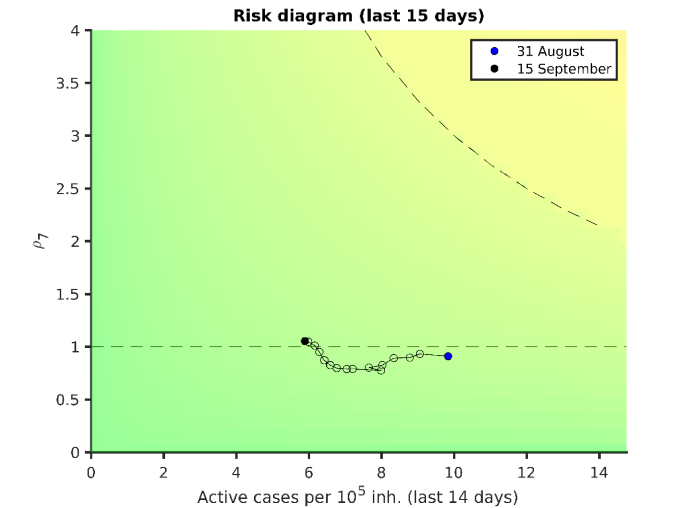
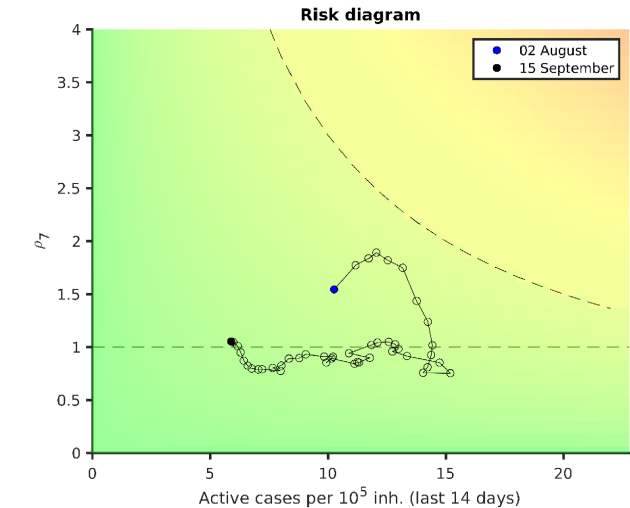
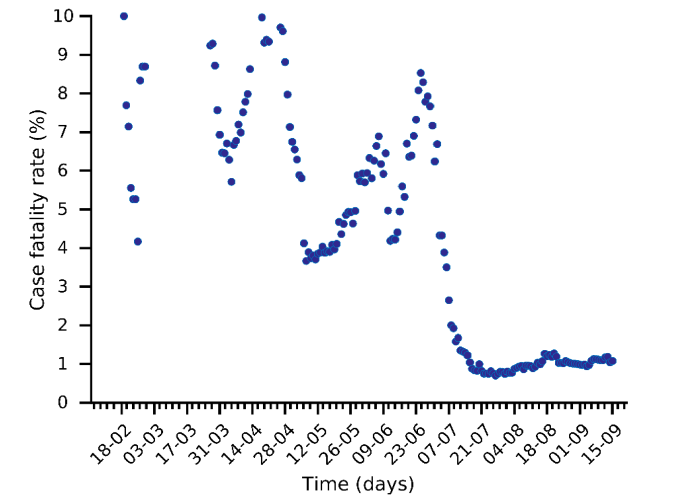
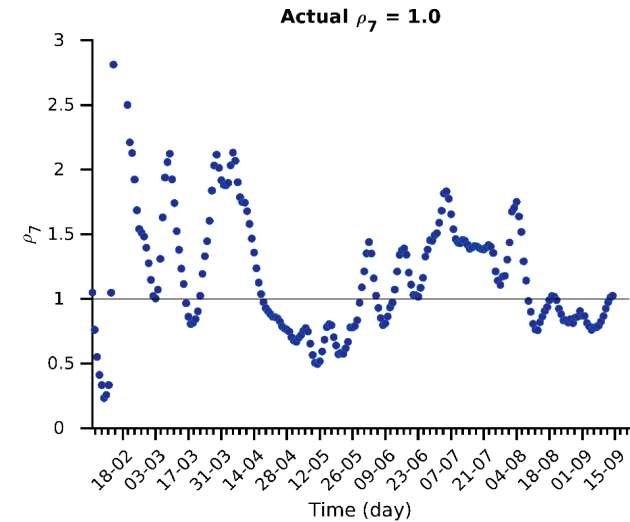
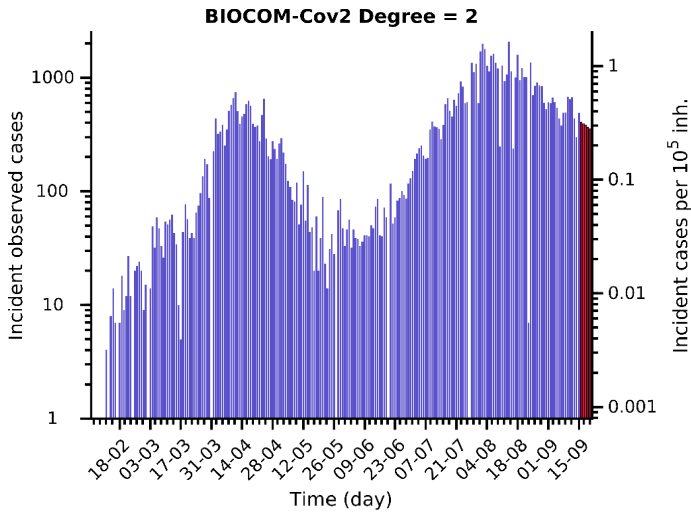
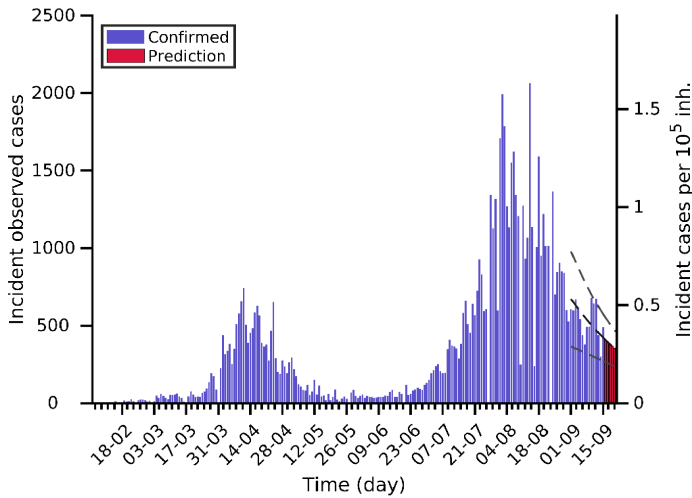


Japan 15-09-2020. Pop: 126.5M. Cumulative incidence: 60/10<sup>5</sup>



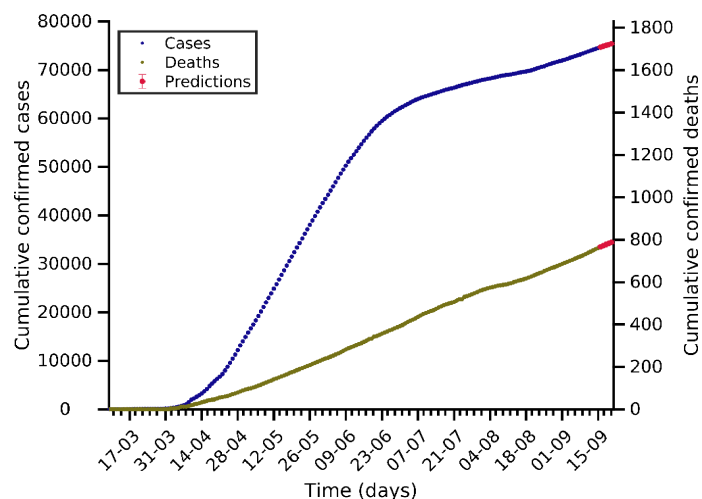
Predictions for next days		
Day	Number of cases	95% Confidence Interval
16-09-2020	76853 (+405)	[ 76448 - 77928 ]
18-09-2020	77628 (+381)	[ 76520 - 78736 ]
20-09-2020	78349 (+354)	[ 77180 - 79519 ]

Current indicators		
A <sub>14</sub>	EPG	CFR
6	6	1.08 %





# Belarus 15-09-2020. Pop: 9.4M. Cumulative incidence: 789/10<sup>5</sup>

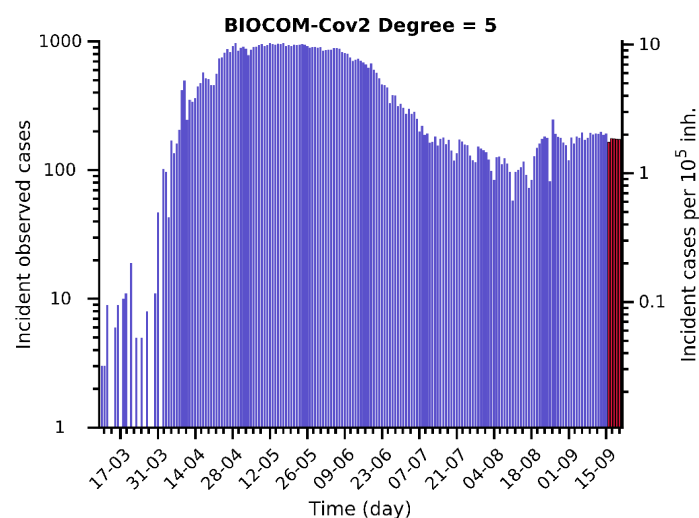
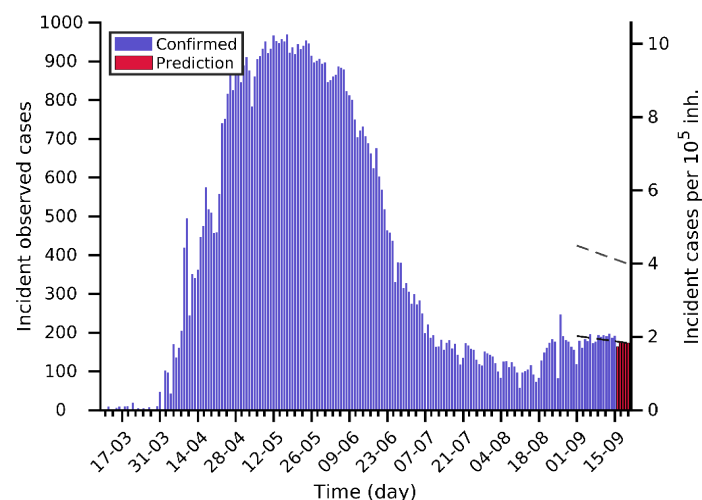


Predictions for next days

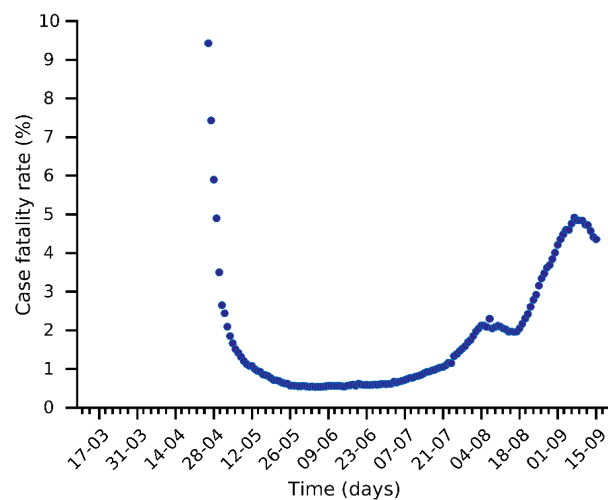
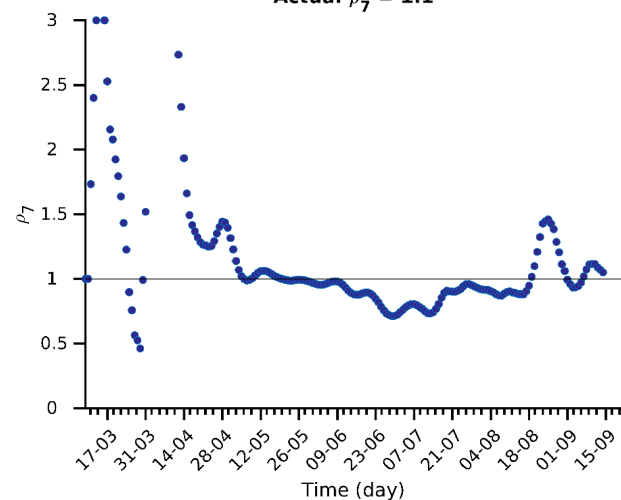
Day	Number of cases	95% Confidence Interval
16-09-2020	74716 (+164)	[ 74552 - 74906 ]
18-09-2020	75067 (+175)	[ 74870 - 75264 ]
20-09-2020	75414 (+173)	[ 75202 - 75626 ]

Current indicators

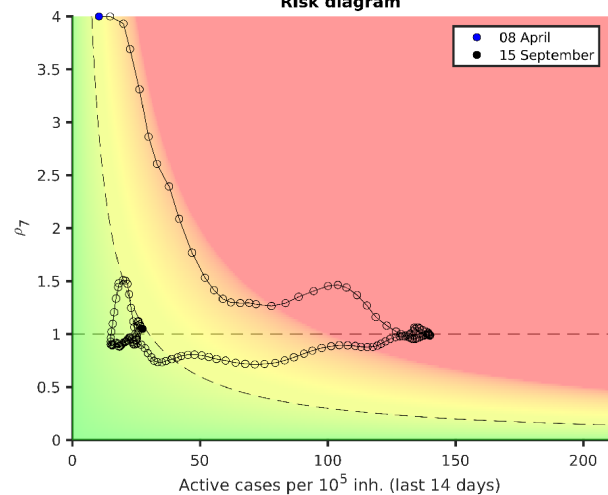
A <sub>14</sub>	EPG	CFR
27	29	4.36 %



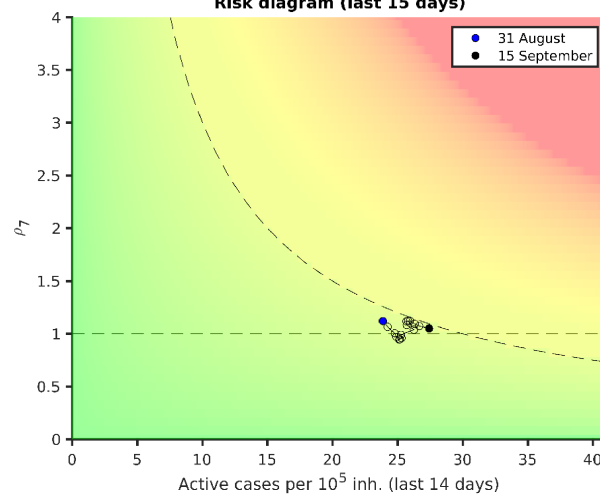
Actual  $\rho_7 = 1.1$



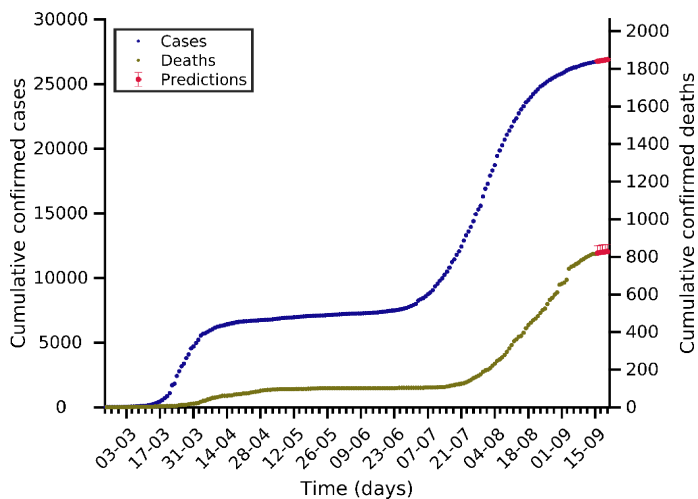
Risk diagram



Risk diagram (last 15 days)



# Australia 15-09-2020. Pop: 25.5M. Cumulative incidence: 105/10<sup>5</sup>

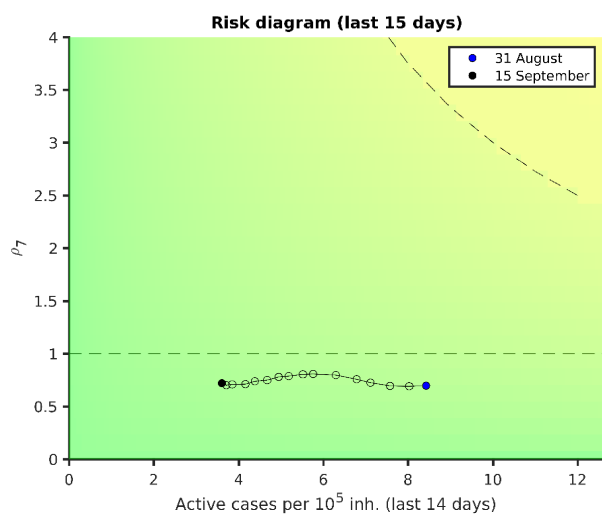
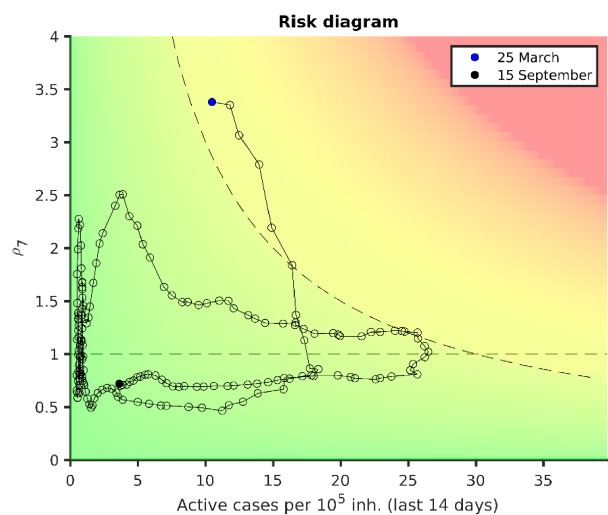
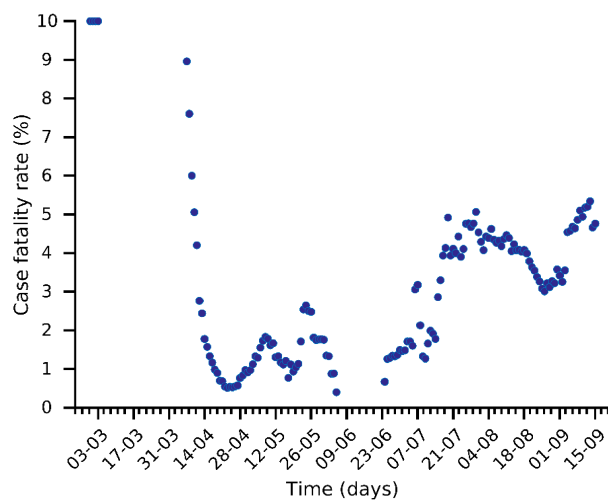
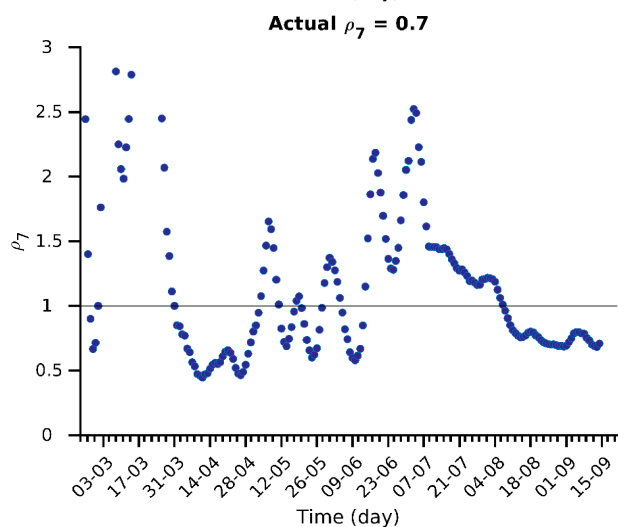
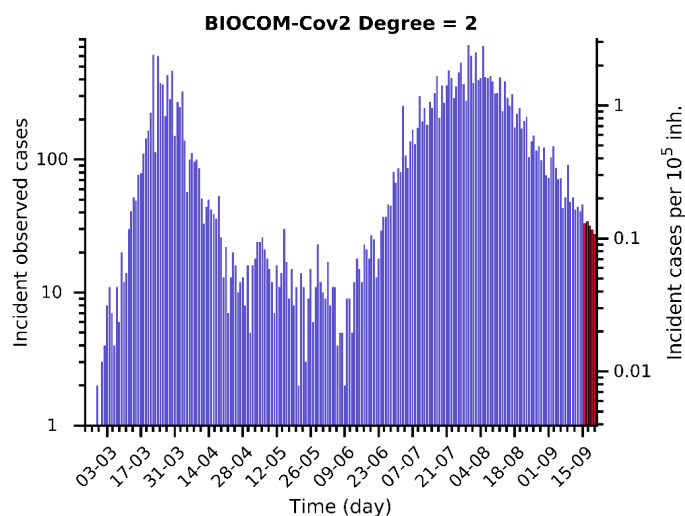
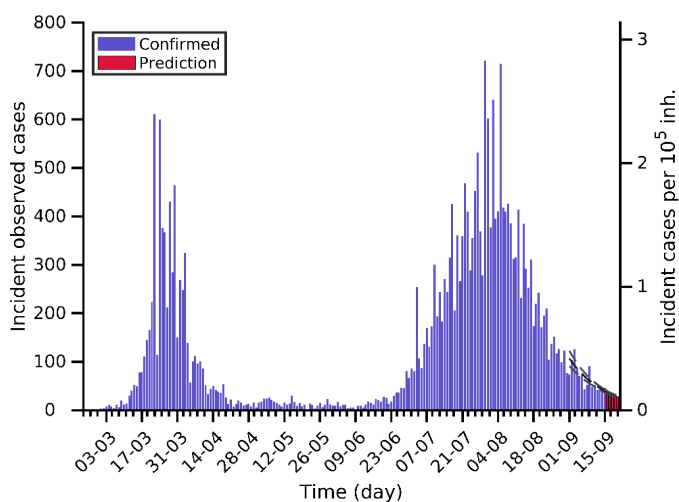


Predictions for next days

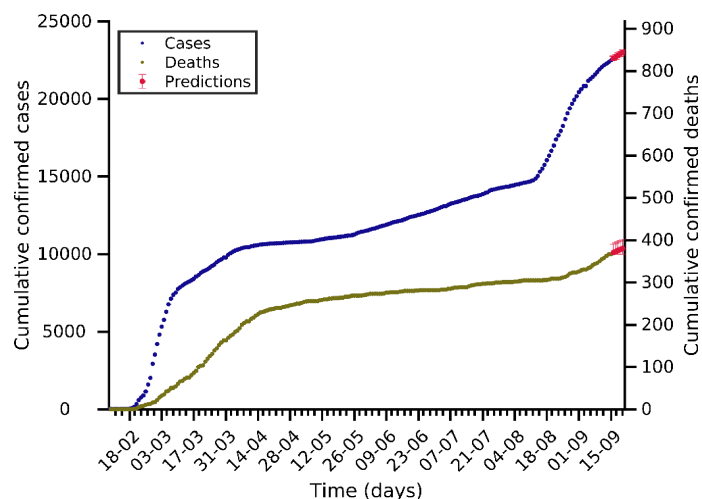
Day	Number of cases	95% Confidence Interval
16-09-2020	26771 (+33)	[ 26738 - 26844 ]
18-09-2020	26837 (+32)	[ 26763 - 26911 ]
20-09-2020	26894 (+27)	[ 26817 - 26970 ]

Current indicators

A <sub>14</sub>	EPG	CFR
4	3	4.76 %



# South Korea 15-09-2020. Pop: 51.3M. Cumulative incidence: 44/10<sup>5</sup>

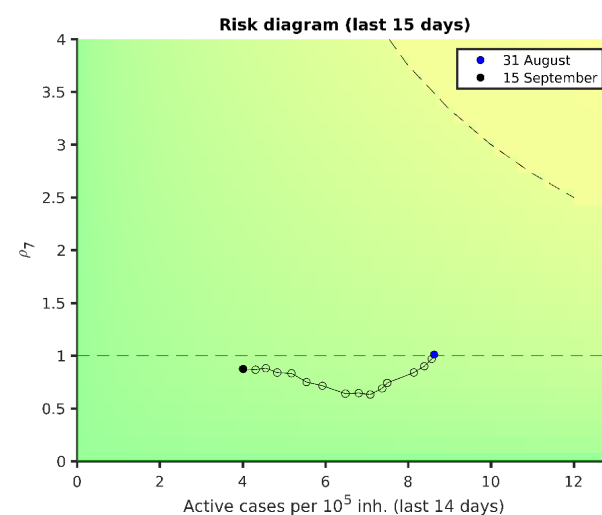
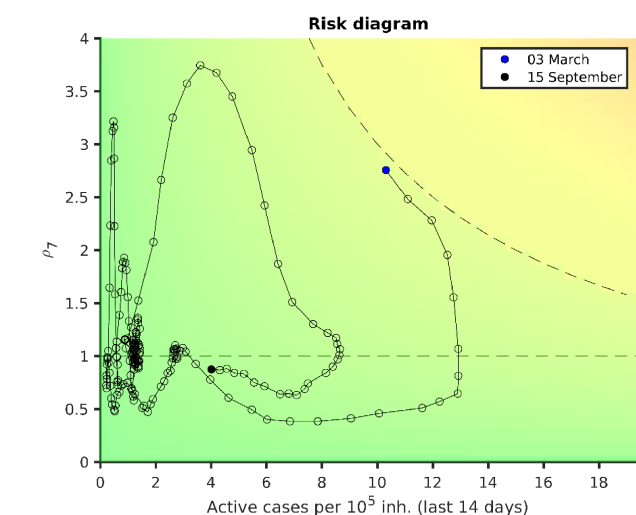
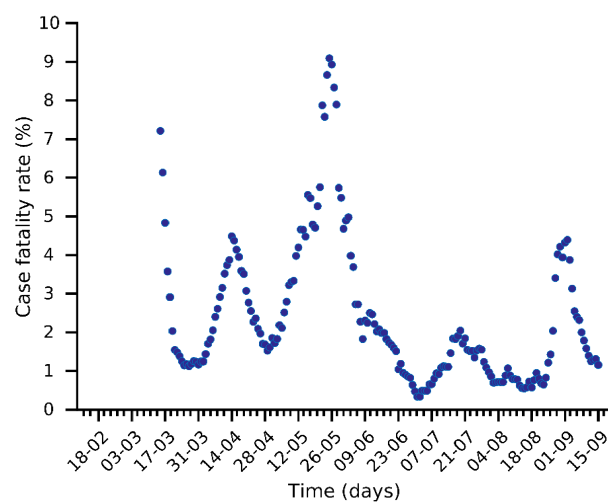
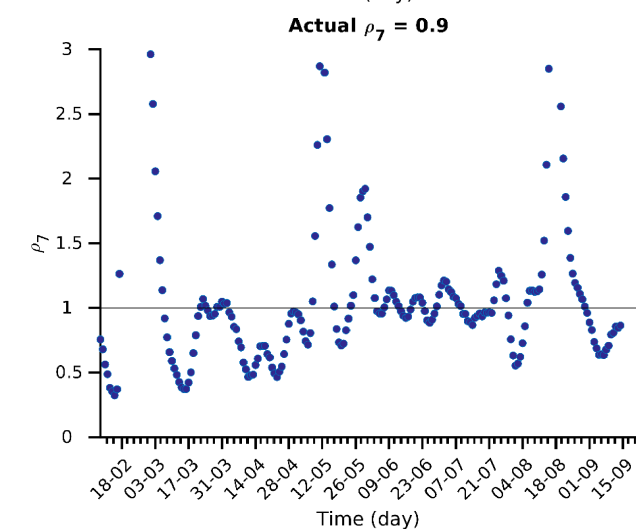
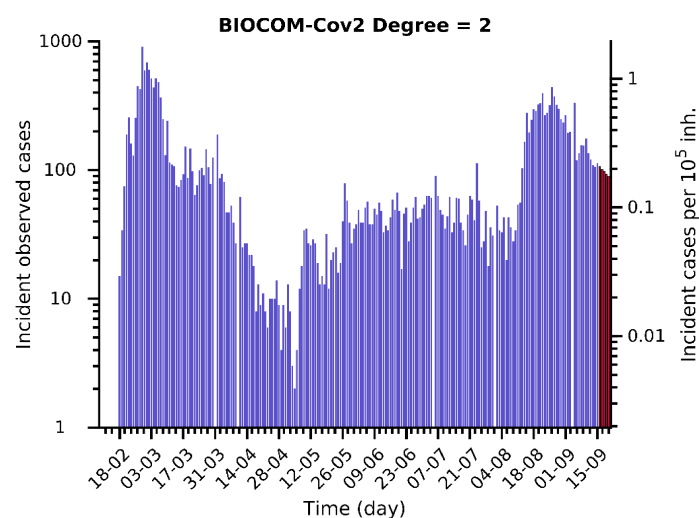
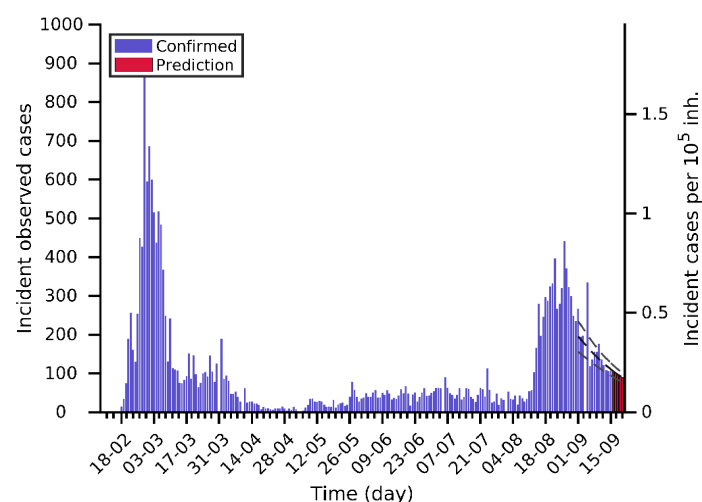


Predictions for next days

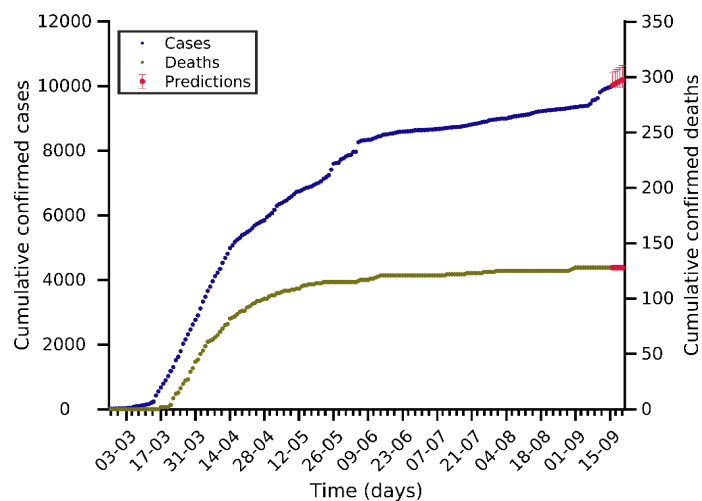
Day	Number of cases	95% Confidence Interval
16-09-2020	22611 (+107)	[ 22504 - 22766 ]
18-09-2020	22810 (+97)	[ 22651 - 22969 ]
20-09-2020	22991 (+89)	[ 22824 - 23159 ]

Current indicators

A <sub>14</sub>	EPG	CFR
4	3	1.15 %



# Malaysia 15-09-2020. Pop: 32.4M. Cumulative incidence: 31/10<sup>5</sup>

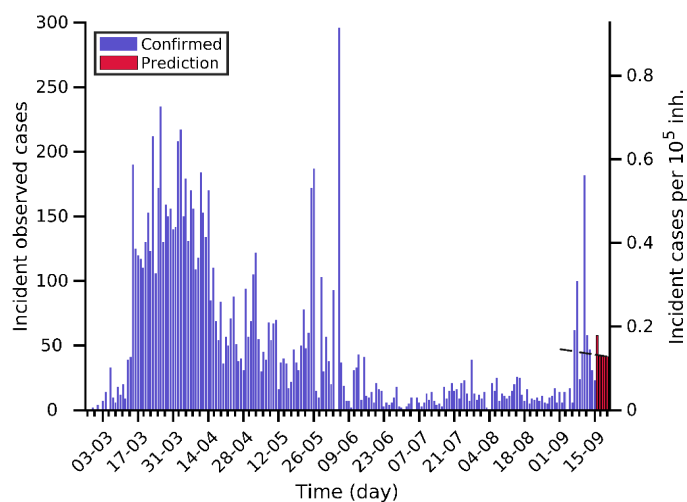


Predictions for next days

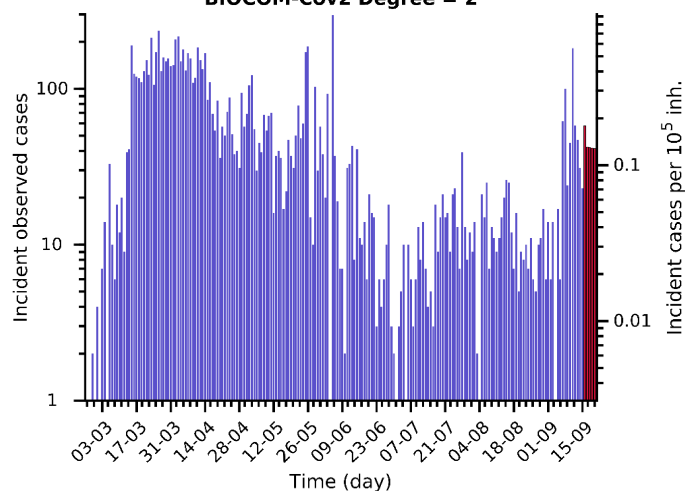
Day	Number of cases	95% Confidence Interval
16-09-2020	10027 (+58)	[ 9969 - 10420 ]
18-09-2020	10111 (+42)	[ 9969 - 10519 ]
20-09-2020	10194 (+41)	[ 9969 - 10632 ]

Current indicators

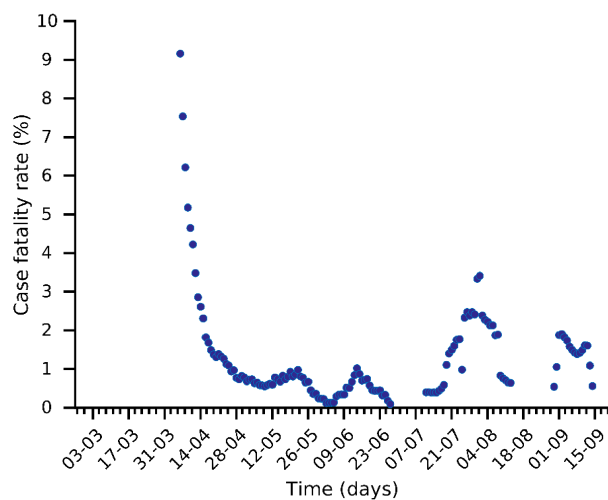
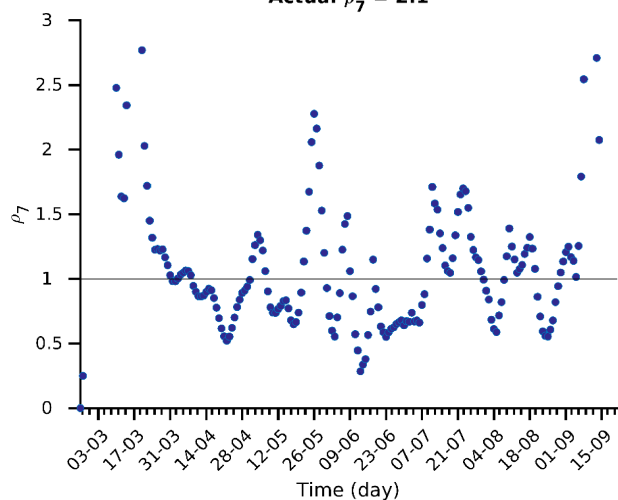
A <sub>14</sub>	EPG	CFR
2	4	0.00 %



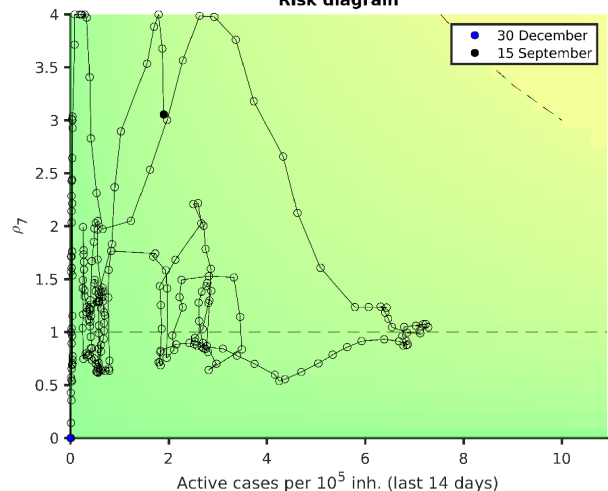
BIOCOM-Cov2 Degree = 2



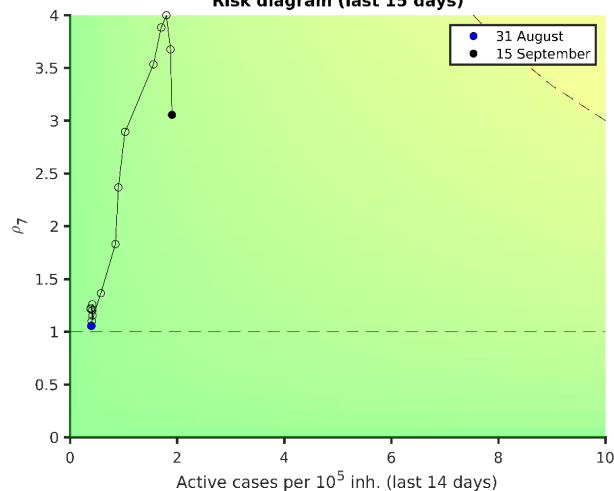
Actual  $\rho_7 = 2.1$



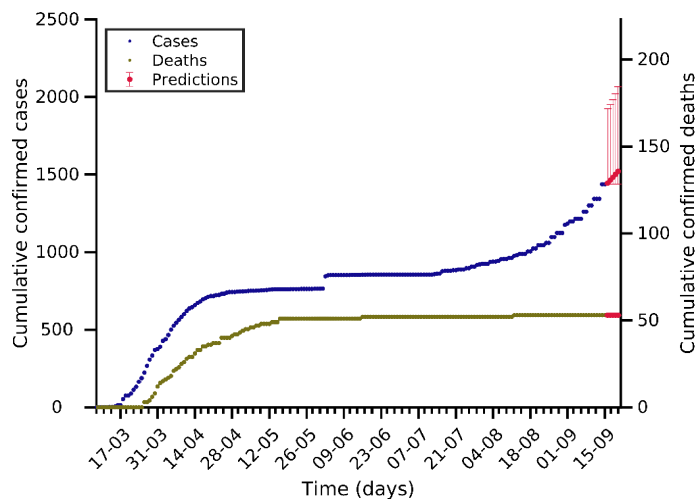
Risk diagram



Risk diagram (last 15 days)



# Andorra 15-09-2020. Pop: 0.1M. Cumulative incidence: 1861/10<sup>5</sup>

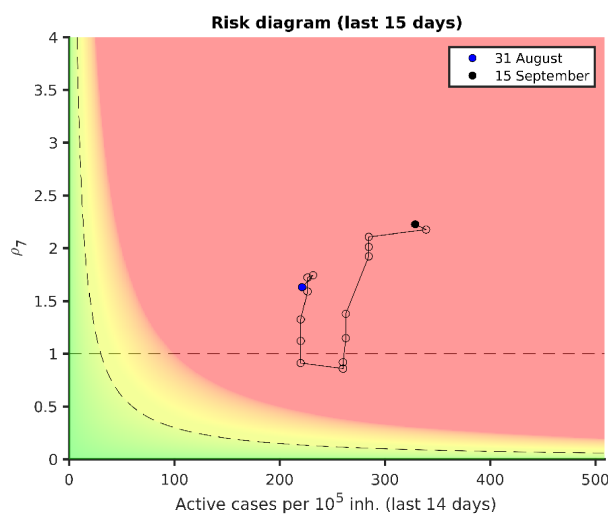
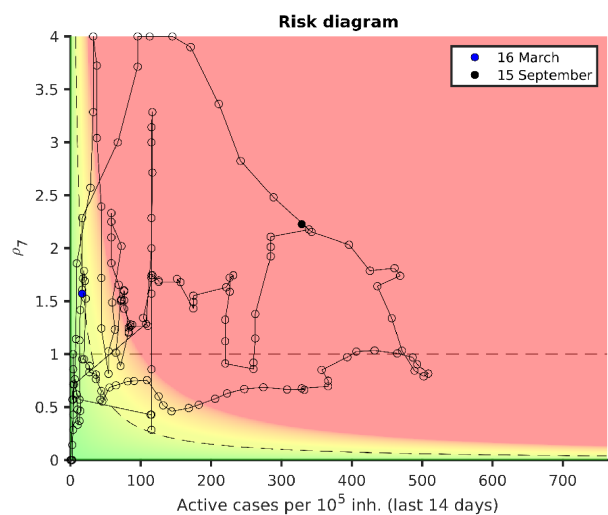
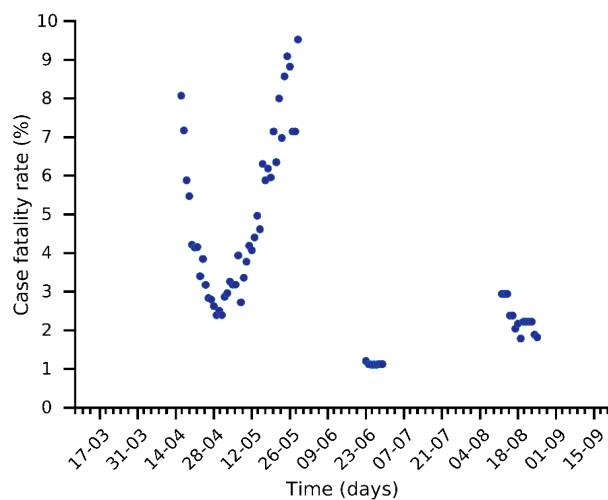
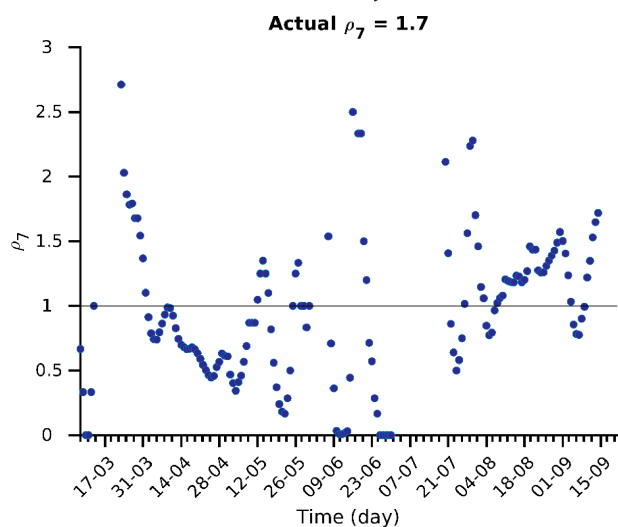
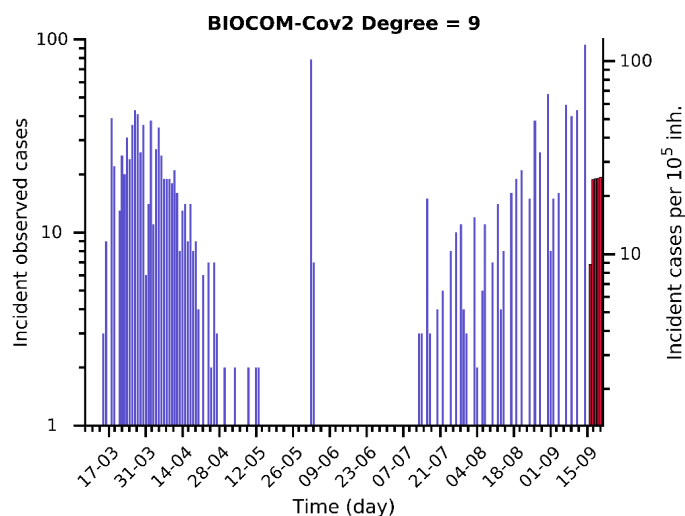
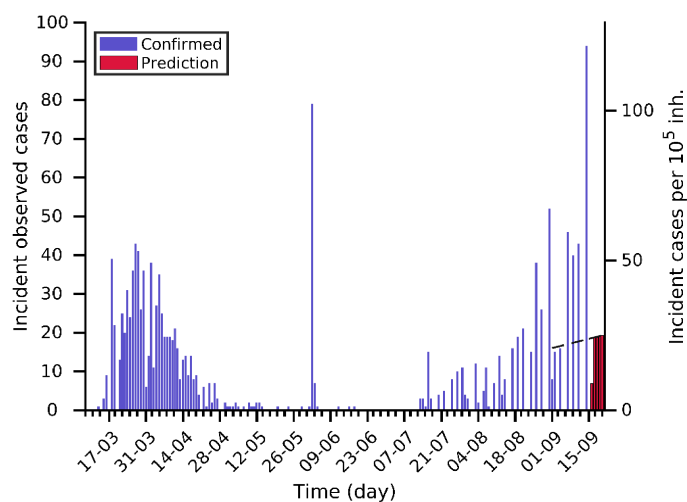


Predictions for next days

Day	Number of cases	95% Confidence Interval
16-09-2020	1445 (+7)	[ 1438 - 1924 ]
18-09-2020	1483 (+19)	[ 1438 - 1983 ]
20-09-2020	1521 (+19)	[ 1438 - 2068 ]

Current indicators

A <sub>14</sub>	EPG	CFR
329	565	0.00 %



## Methods

## Methods

### (1) Data source

Data are daily obtained from European Centre for Disease Prevention and Control (ECDC)<sup>13</sup> and country official sources (when indicated). Daily data comprise, among others: total confirmed cases, total confirmed new cases, total deaths, total new deaths. It must be considered that the report is always providing data from previous day. In the document we use the date at which the datapoint is assumed to belong, i.e., report from 15/03/2020 is giving data from 14/03/2020, the latter being used in the subsequent analysis.

### (2) Data processing and plotting

Data are initially processed with Matlab in order to update timeseries, i.e., last datapoints are added to historical sequences. These timeseries are plotted for individual countries and for the UE+EFTA+UK as a whole:

- ✓ Number of cumulative confirmed cases
- ✓ Number of reported new cases
- ✓ Number of cumulative deaths

Then, two indicators are calculated and plotted, too:

- ✓ Case fatality rate: number of cumulative deaths divided by the number of cumulative confirmed cases, and reported as a percentage; it is an indirect indicator of the diagnostic level.
- ✓  $\rho$ : this variable is related with the reproduction number, i.e., with the number of new infections caused by a single case. It is evaluated as follows for the day before last report ( $t-1$ ):

$$\rho(t-1) = \frac{N_{new}(t) + N_{new}(t-1) + N_{new}(t-2)}{N_{new}(t-5) + N_{new}(t-6) + N_{new}(t-7)}$$

where  $N_{new}(t)$  is the number of new confirmed cases at day  $t$ . Then, we calculate a 7-day moving average ( $\rho_7$ ) so that noise is reduced and trends become clearer.

### (3) Classification of countries according to their epidemic level: the scale Biocom-Cov

Countries are assigned a degree in the discrete Biocom-Cov scale, which aims to facilitate a simple way of assessing the situation of the country. It is based on the level of daily new cases per 100,000 inhabitants as follows:

Pandemic degree	Daily new incident cases per 10 <sup>5</sup> inh.
0	0
1	0-0.1
2	0.1-0.5
3	0.5-1.25
4	1.25-2
5	2-3
6	3-5
7	5-8
8	8-14
9	>14

<sup>13</sup> <https://www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases>

#### ***(4) Fitting a mathematical model to data***

Previous studies have shown that Gompertz model<sup>14</sup> correctly describes the Covid-19 epidemic in all analysed countries. It is an empirical model that starts with an exponential growth but that gradually decreases its specific growth rate. Therefore, it is adequate for describing an epidemic wave that is characterized by an initial exponential growth but a progressive decrease in spreading velocity provided that appropriate control measures are applied. Once in the tail, predictions work but the meaning of parameters is lost.

Gompertz model is described by the equation:

$$N(t) = K e^{-\ln\left(\frac{K}{N_0}\right) \cdot e^{-a \cdot (t-t_0)}}$$

where  $N(t)$  is the cumulated number of confirmed cases at  $t$  (in days), and  $N_0$  is the number of cumulated cases the day at day  $t_0$ . The model has two parameters:

- ✓  $a$  is the velocity at which specific spreading rate is slowing down;
- ✓  $K$  is the expected final number of cumulated cases at the end of the epidemic.

This model is fitted to reported cumulative cases of the UE and of countries that accomplish two criteria: 4 or more consecutive days with more than 100 cumulated cases, and at least one datapoint over 200 cases. Day  $t_0$  is chosen as that one at which  $N(t)$  overpasses 100 cases. If more than 15 datapoints that accomplish the stated criteria are available, only the last 15 points are used. The fitting is done using Matlab's Curve Fitting package with Nonlinear Least Squares method, which also provides confidence intervals of fitted parameters ( $a$  and  $K$ ) and the  $R^2$  of the fitting. At the initial stages the dynamics is exponential and  $K$  cannot be correctly evaluated. In fact, at this stage the most relevant parameter is  $a$ .

It is worth to mention that the simplicity of this model and the lack of previous assumptions about the Covid-19 behaviour make it appropriate for universal use, i.e., it can be fitted to any country independently of its socioeconomic context and control strategy. Then, the model is capable of quantifying the observed dynamics in an objective and standard manner and predicting short-term tendencies.

#### ***(5) Using the model for predicting short-term tendencies***

The model is finally used for a short-term prediction of the evolution of the cumulated number of cases (3-5 days). The confidence interval of predictions is assessed with the Matlab function `predint`, with a 99% confidence level. These predictions are shown in the plots as red dots with corresponding error bar. For series longer than 9 timepoints, last 3 points are weighted in the fitting so that changes in tendencies are well captured by the model.

#### ***(6) Estimating non-diagnosed cases***

Lethality of Covid-19 has been estimated at around 1 % for Republic of Korea and the Diamond Princess cruise. Besides, median duration of viral shedding after Covid-19 onset has been estimated at 18.5 days for non-survivors<sup>15</sup> in a retrospective study in Wuhan. These data allow for an estimation of total number of cases, considering that the number of deaths at certain moment should be about 1 % of total cases 18.5 days before. This is valid for estimating cases of countries at stage II, since in stage I the deaths would be mostly

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<sup>14</sup> Madden LV. Quantification of disease progression. *Protection Ecology* 1980; **2**: 159-176.

<sup>15</sup> Zhou et al., 2020. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *The Lancet*; March 9, doi: 10.1016/S0140-6736(20)30566-3



due to the incidence at the country from which they were imported. We establish a threshold of 50 reported cases before starting this estimation.

Reported deaths are passed through a moving average filter of 5 points in order to smooth tendencies. Then, the corresponding number of cases is found assuming the 1 % lethality. Finally, these cases are distributed between 18 and 19 days before each one.